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THE HARMONY OF INTERESTS:

AGRICULTURAL, MANUFACTURING, AND COMMERCIAL.

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CHAPTER TENTH.

HOW PROTECTION AFFECTS THE FARMER.

Among the large exporters of food are Ireland, Canada, Russia, and the United States.

The first exports both food and population. The bulk of her trade is altogether outward, and the food has to bear all the cost of the voyage out and home. The yield to the producer is therefore small, and tends rapidly to diminish, the consequences of which are, famine, pestilence, and depopulation.

The second exports food and lumber, and imports some population for home consumption, and much that is exported to the United States. The excess of exports is, however, sufficiently great to throw nearly the whole weight of the voyage out and home upon the producer.

Neither of these countries has any protection against the colonial system. The food they export comes back to them in the form of cloth and iron, duty free, and almost freight free, because the bulk of the traffic is in the outward direction.

Russia exports food, but she protects manufactures, and thus makes a market for much of it at home. Her capacity to supply grain is by one authority stated to be equal to 17,000,000, and by another 28,000,000 of quarters, (153 and 252 millions of bushels of 60 pounds weight,) and we are told that—

"In the years when there is no foreign demand for this surplus, a portion of it is employed, with little regard to economy, in fattening cattle for the butchers, and for the sake of the tallow. Much is absolutely wasted, and the remainder, left unthreshed, becomes the prey of birds and mice." Also that "if a foreign market could be found for it, Russia could easily export annually 50,000,000 of quarters of grain, (equal to 450,000,000 of bushels of sixty pounds weight.)"*

The system of that country is adverse to the growth of wealth and intelligence. Large armies and hosts of officials are maintained out of her heavy taxes, paid from the earnings of the producing classes, while the existence of serfdom, and the necessity for giving so large a portion of the lives of the healthiest and best-formed of the population to the business of carrying sabres and muskets, tends to prevent the existence of any hope of improvement; and without hope there can be little disposition for exertion. Nevertheless, as we see, the Russian has food to waste, while Irishmen perish by tens of thousands of starvation.

In this country the system of protection exists. It is now limited to thirty

* London Economist.

per cent.; and for the last twenty years it has but once, and for a very brief period, been at a lower point. By its aid there has been produced a diversification of pursuits, that enables men to economize much time and many things that would otherwise be wasted, while women and children find employment at such wages as enable them to be large consumers of both food and clothing. Wages are high, and hence it is that there is so large an import of the most valuable of commodities—man.

We imported last year about 300,000 persons. Estimating their consumption of food at twenty cents per day for each, there was thus made a market on the land for the products of the land to the extent of *twenty millions of dollars*. Their transportation required the constant employment of 250,000 tons of shipping, and ships carried freight to Europe at very low rates, because certain of obtaining valuable return cargoes. The farmer thus obtained a large home market, and the power of exporting cheaply to the foreign one, and to the conjoined operation of these two causes is due the fact that wheat and flour have continued so high in price.

We may now, I think, understand many curious facts now passing before our eyes. Food is so abundant in Russia that it is wasted, and yet among the large exporters of food to Great Britain is this country, in which it sells at a price almost as high as in Liverpool, and now even higher. The produce of Russia has to bear all the charges out and home, and the consequence is, that the producer remains poor and makes no roads, and thus the cost of transportation, internal and external, continues, and must continue great. The farmer of the United States sends his produce to market cheap, because the return cargo, being chiefly man, is valuable, and the space it occupies is great. He therefore grows rich, and makes roads, and canals, and builds steamboats; and thus is the cost of transportation, internal and external, so far diminished that the difference in the price of a barrel of flour in Pittsburgh and in Liverpool is, when we look at the distance, almost inconceivably small.

The bulk of the trade of Canada is outwards; and the consequence is that outward freights are high, while our imports of men and other valuable commodities keep them low with us, and therefore it is that the cost of transporting wheat and flour from our side of the line is so much lower than from the other, that both now pass through New York on their way to Liverpool.* Hence it is that there has arisen so vehement a desire for commercial re-

* From one of the journals of the day I take the following extract from a Canadian letter:—

"Our commercial relations with your Union are a subject of great anxiety with us at the present time. Wheat is worth from 2*s.* to 3*s.*, York, more on your side of the Lake than on this. This is owing to two causes: the 20 per cent. duty you impose upon our grain when imported and sold in your market, and the want of a sufficient number of resident wheat buyers who have sufficient capital to enable them to take advantage of your bonding Act. If your Cabinet has determined to annex us, they will refuse us reciprocity. In 1847, we exported of Canada wheat, 3,349,686 bushels, and in 1848, 3,413,397. We shall export, at least, twice as much this year; for every acre of land that was in a condition to grow wheat was sown with that grain, and the crop throughout the whole of Western Canada, except perhaps the Middle District, is unusually heavy.

"'The Examiner' estimates, and I think with tolerable accuracy, that our farmers will this year lose $1,500,000, from a want of having free access for their produce to your markets. The Convention of Delegates from each of these Provinces, now sitting at Halifax, have under consideration the question of securing a more easy interchange of commodities between the Provinces and the States. A notion has got abroad, that if Canada, Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland were united, they would then have a better chance of obtaining free trade from you than in their present isolated condition. It is rumoured that the Home Government, for some

ciprocity, and even for annexation. The protective system has thus not only the effect of bringing consumers to take their places by the side of the producer, facilitating the consumption on the land of the products of the land, and facilitating also the exportation of the surplus to foreign markets, by diminishing outward freights, but the further one of producing among our neighbours a strong desire for the establishment of the same perfect freedom of trade that now exists among the several States, by becoming themselves a part of the Union. Protection, therefore, tends to the increase of commerce and the establishment of free trade, while the British system tends everywhere to the destruction of commerce and to the production of a necessity for restriction.

We see, thus, that if we desire to secure the command of that which is falsely called "the great grain market of the world," it is to be effected by the adoption of such measures as will secure valuable return freights. The most costly and the most valuable of all are men. The least so are pig-iron and coal. The more of the latter we import, the larger will be our surplus of food, the higher will be the outward freight, internal and external, the greater will be the waste, and the poorer will be the farmer. The more of the former we import, the smaller will be our surplus of food, the lower will be the outward freights, and the more numerous will be the commodities that can go to Europe, to be given in exchange for luxuries that now we cannot purchase.

Were we now importing a million of men annually, the dowhward freights on our canals and railroads would be greatly diminished, while the outward freight across the ocean would be little more than would pay the cost attendant upon loading and unloading it, and yet we should be building ships and steamboats, and making railroads at a rate of which we could now form no conception.

By aid of these men, coal and iron would be produced by millions of tons, and the increased facility of obtaining food and iron would give new facilities for building cotton and woollen mills, and type-foundries and printing-offices, and all the men employed in them would be large consumers of food, and thus would the farmer gain on every hand.

The labourer, in Ireland, obtains 6*d.* or 8*d.* for a day's labour when employed, but the average of the year is even less than the former sum. He is our great customer for Indian corn, the cost of which, by the time it reaches him, is about 4*s.* or five times what it has yielded to the farmer, delivered on his farm. Eight day's labour are thus required for the purchase of a bushel. Transfer that man to the coal-fields of Ohio or Indiana, and he may purchase far more by the work of a single day. He at once becomes a much better customer for food, and is enabled to consume largely of sugar and coffee, to the advantage of the merchant—of wool, to the further advantage of the cultivator of the land—of lumber, to the advantage of the man who has land uncultivated that he desires to clear—of cotton, and indigo, to the benefit of the planter—and thus it is that every interest in the country profits by the transfer of the poor cultivators of Ireland, and of Germany, to the coal fields and iron-ore beds of the Union.

The young Englishman who aspires to be an operative spinner, and now fills

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purpose of its own, has recommended this federation, and of course the Colonial puppets who move at the dictation of Downing street, will pretend that a measure which has been forced upon them, originated in the commercial necessities of the Provinces. To obtain the free trade they desire, the Nova-Scotians showed symptoms of a willingness to admit your fishing vessels a little nearer than within three miles of their shores; and Canada would probably throw open her coasting-trade to your vessels, if England will permit her, after the new Navigation Law comes into operation."

the place of the latter in his absence, receives 7*s.* 6*d.*—$1·80 per week,* the price of two bushels of Indian corn. Place him in Alabama, and he will earn the present price of twenty bushels, and he will then eat more and better food, and consume ten pounds of cotton where now he consumes but one.

The hand-loom weavers, of whom England has 800,000, without work for one-third of the number,† consume little food or cotton. Transfer them here, and they will become large consumers of both.

The agricultural labourer of England receives 8*s.* or 9*s.* a week, little over the price of a bushel and a half of wheat. Transfer him here, and his services as a miner, or labourer, will enable him to earn the price of five or six bushels. He will then consume more and better food, and largely of cotton.

The poor Highlander, driven from his native hills to make room for sheep, starves in the miserable lodging-houses of Glasgow.‡ Could he be transferred here, he would become a large consumer of food and clothing.

Our present policy is directly the reverse of all this. We are exporting men by tens of thousands to California, and by hundreds of thousands to the West, thus diminishing the power of combination of action, and increasing the necessity for the use of ships and wagons to carry their produce to market. Thus far the immigration has been maintained, and freights to Europe are consequently low, but, with the diminished wages of the labourer, immigration must fall off, and then freights must rise, and thus the same measures that diminish the home consumption must increase the cost of going to the distant market. The cost of the voyage out and home *must* be paid by somebody. If there is no return freight, the farmer or planter must pay the whole. If there is a large and valuable return freight, he need pay scarcely any portion of the cost. To California, we must pay all the outward freight, for there is no cargo to be returned. Bulky articles, the produce of the farm, cannot, therefore, go from here, and the consequence is, that every emigrant to that country is a customer lost to the farmer, and a customer to a diminished extent to the planter.

The most costly and most valuable of commodities, as I have already said, is Man. The more valuable the commodities that can be imported into any country, without going in debt for them, the richer that country will grow; and this is equally true of every State, county, township, town, &c., into which it may be divided. Of this no one can doubt, and yet every portion of the Union is engaged in exporting to the West, to Texas, Oregon, and California, this most valuable of all commodities, receiving

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* London Economist, Vol. VI. p. 259.

† Edinburgh Review, October, 1849.

‡ A recent British journal, speaking of the Queen's visit to Scotland, thus describes the effects of the desolating policy that has been pursued in the Highlands:—

"*The untilled hills and glens tell their own story most effectually.* The sheep farms of twenty miles length and breadth proclaim the dark character of that policy which is fast making of the Highlands a great hunting-ground. Her Majesty is to pass through a land of Ameers. The same wretched policy as that which has desolated Scinde, originating in the same miserable cause—the selfishness and pleasure-seeking of the owners—has laid waste the Highlands. They want a Sir Charles Napier—a legislative if not a military Napier. *They need the repeal of the game and entail laws, and with those laws repealed, in twenty years there would be no difficulty in finding a population to welcome the monarch on the beautiful but now desolate shores of Loch Long and Loch Awe.* The pines§ would flourish again; and newspaper reporters would not be weighing the question whether there be or be not a habitable house where they might rest within ten miles of Loch Laggan."—*North British Mail.*

§ The standard of the Campbells, who inhabited this region, bore a pine.

nothing in return. We import now hundreds of thousands, yet the old States retain scarcely any of them. All must go West, for the working of mills and furnaces is stopped, and the building of mills is at an end until we have a change of policy. Such is the effect of the colonial system, established for the purpose of preventing combination of action among the people composing various nations of the world, and maintained by the pursuit of measures destructive alike to the interests of the people of England, and of the world at large. "Many of our manufacturers," says a Manchester broker, "have exported to a loss, and if, by so doing, they have kept foreign competition at bay, and checked the increase of industrial establishments abroad, it is an unenviable success; still," he adds, "as this country is doomed to be a manufacturing state, nothing remains but to beat or be beaten."*

These losses are of perpetual recurrence. They are a natural consequence of the "war upon the labour and capital of the world," in which England must "beat or be beaten." They must be paid by somebody, and they *are* paid by the labourers of England, who are compelled to work at diminished wages; but to a much greater extent by the labourers of the world, who are compelled to be idle, earning nothing to pay the farmers and planters for food and clothing, when they would gladly be employed, earning wherewith to feed and clothe themselves and their children.

How small is, under these circumstances, the power to consume food, will be obvious to those who see that three-fourths of the people of England are consumers and not producers, and that yet their import of grain of the last two years of free trade is but two bushels per head. How insignificant is the quantity she takes from us, and trivial the amount when distributed among the people of the Union, may be seen from the following statement of the last two years of comparatively large export:—

	Flour. Barrels.	Wheat. Bushels.	Corn. Bushels.	Corn-meal. Barrels.
Year ending June 30, 1848,	958,744	1,531,000	5,062,000	226,000
" Aug. 31, 1849,	1,114,016	4,684,000	12,721,000	88,000

The last and largest amounts in round numbers, to 10,000,000 of bushels of wheat, and 13,000,000 of bushels of corn. Deducting the transportation, the product of this on the farm may be taken at not exceeding, and probably not equalling $10,000,000, or less than fifty cents per head for the people of the Union. What is the prospect that even this amount will continue to be exported may be judged by the facts that nothing but the exceeding lowness of freights has thus far maintained the export, and that calculations, based upon the low price of food in Europe, are now being made upon the export of grain to this country.

"The accounts that have reached us from your side about the wheat crop have led to an idea here that it is not improbable the United States may become an importing country for grain, as on some previous occasion about ten or twelve years ago. We regard this as highly improbable ourselves, although Sturges allude to it in their commercial circular to-day. It is said *Mark Lane governs the world's grain prices:* and, if so, the European range may certainly be expected to be very low, for the fall here is fully 5*s.* to 6*s.* per quarter, one-sixth of the entire value, within the last month. Oats are down to 16*s.* per quarter."—*London Correspondent of the National Intelligencer.*

The shipments of both wheat and flour have already fallen off in a most extraordinary degree, since freights have somewhat advanced. In September, flour was carried to Liverpool for 6*d.* a barrel, and sometimes even less. The lapse of two months has brought the charge up to 18*d.*, and the

* Circular of Du Fay & Co., March 1, 1848.

effect is shown in the following statement of the export from the principal ports of the Union from the first of September to the latter part of November:—

	Flour. Barrels.	Meal. Barrels.	Wheat. Bushels.	Corn. Bushels.
1849 . . .	118,000	1,210	212,504	544,874
Last year, same period	491,000	27,754	849,350	3,447,820
Decrease . . .	373,000	26,544	636,846	2,902,946

Notwithstanding the large increase of agricultural population, the quantity of wheat and flour received at tide-water, on the Hudson, shows a diminution, while the only increase is that of about 2,000,000 of bushels of corn, which found a market abroad only because of the very low freights.

The import of men has made a market for $20,000,000 worth of food, and these people, once here, remain consumers of food, and customers to the farmer, unless compelled to become producers of food and rivals to the farmer.

The "great grain market of the world" has absorbed half as much because of the low freights, but with the advance of freight it is now diminishing, and must still further diminish with the continuance of that advance. "Since the commencement of the California excitement, near seven hundred vessels," we are told,* "have left for the Pacific, many of which will never re-visit us." These ships will not be replaced unless freights be sufficiently high to pay their owners. If immigration go on, they will be soon replaced, and the cost of doing it will be paid by immigrants who come to be customers to the farmer and planter. If it do not, they will not be replaced, and the high freights of the remaining ones must be paid by the farmers and planters seeking customers in Europe.

That immigration will be arrested, must be obvious to all who study the tables given in the third chapter. The difficulty of obtaining food, fuel, and clothing—*i. e.* wages—in return for labour, is increasing. The value of man is falling, and the inducements to immigration are passing away. Should it diminish next year to the extent of 100,000 persons, there will be a loss of market to the extent of $7,000,000. The California excitement which carried off so very many thousands of the customers of the farmer, with food to feed them on the road,† will no longer exist. Here is another hundred thousand customers lost to the farmer, and with them a demand for another $7,000,000 worth of food. The European market is being closed. What, then, are the farmers' prospects at this moment?

A comparison of the amount of immigration and the prices of wheat during the last few years, will show how essentially the interests of the farmer are connected with every operation tending to bring the consumer to take his place by the side of the producer:—

Years.	Immigration.	Price of Wheat in Philad.	Price of Flour in N. Y.
1840 .	84,000 . .	$1·00 . .	$5·25
1841 .	83,000 . .	94 . .	5·72
1842 .	101,000 . .	1·12 . .	5·74
1843 .	75,000 . .	75 . .	4·47
1844 .	74,000 . .	89 . .	4·70

* New York Herald.

† "Your receipts of beef from Missouri will be very moderate this winter, in consequence of the great demand for cattle to carry emigrants to California."—*Correspondent of the Tribune.*

Years.	Immigration.	Price of Wheat in Philad.	Price of Flour in N. Y.
1845	102,000	86*	4·52*
1846	147,000	1·04	5·23
1847	234,000	1·33	5·96 [potato rot.]
1848	229,000	1·19	about 5·25
1849			5·00

If we convert into iron delivered back upon the farm, free of duty, all the food that has been this year exported, we shall find that it will yield 250,000 tons, or twenty-five pounds for every person of the population. Let us now go to the vicinity of a furnace, and see how light, by comparison, is the charge for iron when it is produced on the spot, and paid for in commodities of which the earth yields by tons, as potatoes or hay—or in straw that would otherwise be wasted—or in labour not required on the farm, and then estimate how many tons might have been obtained by the producers of this grain, had they made a market on the land for the products of the land.

Let us now suppose that instead of closing old furnaces we had built fifty new ones, each capable of making 5000 tons, with rolling-mills to convert the product into bars, and had thus applied the labour of some of those immigrants; and that we were now making, as we might readily be doing, 250,000 tons of iron more than was made last year, would not that alone have made a *permanent* market on the land for as much of the products of the farmer as we have exported to England? Would not that have reduced the cost of iron? Would it not have raised the price of labour? Would it not have promoted immigration? Would it not have promoted the building of ships and the reduction of freights? Would not the farmer thus have had the control of the market of England to a much greater extent than he can have under a system that discourages immigration and ship-building? Does not his *power* to go abroad increase with the diminution of the *necessity* for seeking a market abroad? If we were importing largely of raw silk and men from Italy, could we not send cotton yarn to Italy more cheaply than it now goes through England?—and if we were importing silk weavers from France, could we not send to France in return food, in the form of coal† and iron, at less cost for freight than that at which they now have English coal and iron that must pay all the cost of the voyage out and home? The greater the value of the import trade—and men are the most valuable commodities we can import—the greater will be the variety of articles we can export.

It is contended that by having two markets to which he *must* resort, the condition of the farmer is improved, and that if he had but the home-market he would have lower prices than at present—that is to say, that if he could sell all he produces at home, he would obtain less than he now obtains by going from home. Directly the reverse is the fact, when men are *compelled* to seek a distant market.

The first questions to be asked in reference to this are—Why is he obliged to go from home? Why does the supply of food increase faster than the demand? For this there are two reasons. First: we do not import consumers enough; and, Second: of those whom we do import, too many are forced to become producers of food, in consequence of the difficulty attendant upon employing themselves in other pursuits when they would be consumers of food. The man who works in a coal mine earns $300 a year, and perhaps more. Much of this goes for food,

* Some of these variations are, of course, attributable to the extent of the crop. The yield of wheat in the West in this year was larger than in any since 1839.

† Offers have been made to transport coal to France at little more than the ordinary freight from Philadelphia to Boston.

and all of it goes in payment for things that are the product of the earth, for every man is a consumer to the full extent of his production. Ten thousand miners and labourers are customers for those products to the extent of $3,000,000. Forty thousand mechanics, miners, and labourers, are customers to the farmer and planter to the extent of $12,000,000, which is far more than we can expect to export in future years. We now import annually above a quarter of a million of people, and there are half a million of our own home-grown population annually attaining maturity. By deducting from agriculture 20,000 working-men we diminish the number of producers, and by employing these 20,000 in other pursuits we increase the number of consumers to such an extent as to prevent the existence of the surplus of which we now complain. Judging, however, from the past, the adoption of protection as a permanent system would result in the increase of immigration to a vast amount, and of these a large proportion would gladly remain consumers of food, whereas under the present system they are compelled to become producers of food.

When farmers have a demand at home for all they raise, they obtain a higher price than when they have to go abroad. In the one case, they obtain nearly as much *more* than the price in distant markets as the cost of transportation *from* those markets, whereas, when they have to go abroad, they obtain as much *less* than the price in those markets as the cost of transportation *to* those markets, *and the price of the whole is regulated by that which can be obtained for the trivial surplus.* Grain and flour have for several years been higher in the coal region of Pennsylvania than in Philadelphia, because the demand has been always in excess of the supply. Close the mines, and the farmers will have to send their products to Philadelphia, receiving therefor the city prices, *minus* the cost of transportation. At the present time, the price of grain throughout the Union is maintained wholly by the domestic market, for flour sells in Liverpool at less than the price in New York. Close the mines and factories, and convert miners and mechanics into farmers, and the price at home must be the Liverpool one, which will then be *lower* than at present, *minus* the cost of transportation, which will then be *higher* than at present.

Admitting, however, that we are to have at all future times, a surplus of grain for export, the next question would be—What is the course that will secure to the farmer the highest price in foreign markets? The answer must assuredly be, that it will be that which tends most to diminish the quantity to be sent to those markets from this or other countries. If, then, the present system of the commerce of the world tends to increase the supply, it must be adverse to the interests of the farmer. That such is the case can, I think, readily be shown.

We know that the more miners and mechanics we have, the more food we consume; and that the more agriculturists we have, the more food we produce. Such, then, must be the case with other countries. We know that under the protective system miners and mechanics increase in number, and that under the free-trade system the producers of food increase in number. Such, then, must be the case with other countries. It is obviously, then, to our interest that Russia and Germany should consume more food and export less, and that if they and we should do so, the price of food would rise. Russia and Germany, and we ourselves, have established the protective system, and the result has been to increase the consumers and diminish the producers; and if all the world could follow our example, the supply of food now pouring into "the great grain market of the world" would be so far diminished that the price would rise. This, however, is

but one of the effects that would result from a general determination to put down the colonial system.

We have seen that the consumption of cotton in other countries is small, while here it is large. The price has already fallen so low that the planters are resorting to the cultivation of wheat, a measure that must tend to the injury of the farmer. Now, if we were consuming one half more cotton than at present, this state of things could not exist. The price obtainable by the planter would then be sufficiently high to prevent the necessity of abandoning its culture. Let us now suppose that Canada, and Russia, and Germany, and Ireland, could make a market for their now surplus labour, and thereby enable themselves to consume two or three pounds of cotton, where now they consume but one, and to consume more food than now they do—is it not obvious that the prices of food and cotton would both rise? That such would be the result of the abolition of the colonial system, as regards these countries, appears perfectly certain. If so, then the maintenance and extension of the protective system, with special reference to the entire abolition of that unnatural one which Great Britain has established, appears to me to be, most certainly, to the interest of the farmers as well as of the planters of the Union, and of the world.

Let us next examine the working of the system in Canada, in which there being, almost literally, no manufactures of any kind, there is no market on the land for the products of the land.

Freedom of trade is, there, perfect: that is to say, the people of Great Britain enjoy *a complete monopoly* of the machinery by aid of which alone the lumber and food of the people of Canada can be converted into cloth and iron. The consequence is, that the labour-cost of manufactured articles is so great that the consumption of them is small. The whole export of cotton cloth from Great Britain to her North American possessions, in the seven years, 1840–46, averaged twenty millions of yards, fine and coarse, and if the whole were there consumed, it would give but ten yards per head, or about two and a half pounds of cotton to each individual; whereas the consumption of the Union averages thirteen pounds per head, and is far more than that in the States nearest to Canada. If, now, we desire to know why it is that consumption is less on the one side of the line than on the other, the reason may be found in the fact, that the Canadian gives much more labour for his cloth and his iron than the American. Even his wheat is less in price; and if so, how must it be with those bulky commodities that will not bear transportation? He must, in the words of Sir Francis Head, "eat all he raises," for he has not made, nor can he make a market on the land for the products of the land.

To the Canadians it is perfectly obvious that the price of food with us is maintained by the demand for home consumption, and therefore it is that there exists so universal a desire for the abolition of all restriction in the importation of their productions into the Union. They have perfect freedom of trade with "the great grain market of the world," and by it they are ruined. They desire intercourse with the great grain-*producers* of the world, and to obtain it they would gladly sacrifice their intercourse with England, taking production in lieu of free trade, and becoming members of the Union.

Were Canada within the Union, her consumption of cotton would rise to a level with our own, for she would at once commence to make iron and cloth at home, producing thereby a demand for labour that is now being wasted. Instead of being a customer to the planter to the extent of two and a half pounds per head, every Canadian would take a dozen pounds; and thus would fifteen millions of pounds be added to the consumption, to the infinite advantage of the planter. The farmer of Illinois might then safely admit of free trade with

his Canadian neighbours, because with increased home consumption they would experience less necessity for going abroad to find that market for their products which the colonial system now denies to them at home. The farmer who believes in the advantage of free trade with England, should give his vote for the free admission of Canadian wheat, raised by men who consume cloth and iron made by men who eat the wheat of Poland and Russia. The farmer who sees that the price of wheat is maintained by the home demand, will be cautious of the admission of foreign wheat, duty free, until, by means of annexation, the farmer of Canada shall obtain the same protection that he himself enjoys, and thereby be enabled to make a market on the land for the products of the land.

Having thus examined the effects of protection, let us now look to what would be the effects of the adoption of perfect freedom of trade, as urged upon the world by England. It could not fail to be that of *rivetting upon the world the existing monopoly of machinery for the conversion of the products of the farm and the plantation into cloth and iron*, closing the factories and furnaces of Russia, Germany, and the United States, and compelling the people who work in them to seek other modes of employment, and the only resource would be to endeavour to raise food. There would then be more food to sell; but who would buy it? We have already seen that the whole exports of Great Britain amount, after paying for the grain she now imports, to but **$4 32** per head, and that, small as it is, it tends to diminish. With that she has to pay for her sugar, tea, coffee, cotton, wool, lumber, and all other foreign articles required for her own consumption, leaving her no power to pay for more grain. Nevertheless it would be poured into her markets, and the consequence would be that she would obtain three bushels where now she has but one, precisely as we have seen to be the case with cotton. "Mark Lane governs the world's grain prices," and as the price obtainable for the surplus would fix that of the crop, the result would be, that the farmers would everywhere be ruined, and this with no benefit to the manufacturers of England, for her farmers would likewise be ruined, and her agricultural labourers would be discharged, as is now the case with Ireland, whose population, deprived of employment at home, swarms to England, and destroys the power of the English labourer to obtain food, even at its present low prices—and the lower they fall, the less must be the demand for labour, and the less the power to obtain wages.

The proverb says, "put not too many eggs in one basket." The object of the British system is, and has always been, that of compelling the world to put all the eggs in the same basket; and the natural result is the occurrence of perpetual convulsions, producing devastation and ruin throughout the world, whenever her artificial system becomes deranged. A review of her operations, during the past thirty years, shows her, at every interval of four or six years, holding out to the world the strongest inducements to send her all they could spare of sugar, and coffee, and cotton, and agricultural produce of every description. About the close of the second year of this movement, when the machinery of importation had got into full operation, a change is seen to have "come over the face of the dream," and the whole energies of the country to have been directed to breaking down prices, with a view to compel exportation. The farmers and planters whom she so recently courted are now ruined. Their agents are selected as the first victims, and if the result be bankruptcy, public or private, it is followed by vituperation of the foulest kind; and thus is insult added to injury. The people of Pennsylvania and Maryland, Indiana and Illinois, Michigan and Mississippi, have had to endure all this, the result of the working of the Compromise tariff of 1833. In 1846, the whole world was urged to send food at any price.

In 1847, the whole object was to depress prices. Rice was sold for the mere freight and charges. Large shipments of corn brought the shippers in debt for the payment of those expenses. The fever and the chill having passed away, there is next seen to succeed a period of languor: then one of moderate activity, such as is now beginning to make its appearance. Next, speculation, excitement, and large imports, to be followed by the ruin of all around, in the effort to save herself. At the present moment, she takes certificates of debt in payment for iron, as was the case ten years since; but the day is not far distant when these certificates will have to be redeemed with gold.

Were it proposed to the people of the Union to make New York or Pennsylvania the deposit for all the products of the Union that required to be converted or exchanged, the absurdity of the idea would be obvious to every one. The wheat-grower of Michigan would find himself entirely at a loss to know why he should exchange with the neighbouring wool-grower by way of New York; and the cotton-grower of South Carolina would be equally at a loss to see the benefit of a system that should compel him to exchange with the wheat-grower of Virginia, through the medium of Philadelphia or Pittsburgh; yet such is precisely the object of the colonial system. The wheat of Michigan travels to Liverpool with the wool of Michigan, and the exchanges between the wheat-grower and the wool-grower are effected through the market of Leeds, three-fourths of the wool and the wheat being lost on the road. The rice of South Carolina goes to Manchester in company with the cotton of South Carolina; and the corn and the cotton of Tennessee cross the ocean together; and this long journey is performed under the idea that the planter can obtain more cloth for his rice, or the farmer more iron for his corn, by this circuitous mode of exchange than he would do if the exchanges were made on the spot. There are many who doubt the truth of this, yet all English politico-economical writers assure us that such is the fact; and every measure now adopted by the British Government is directed towards the maintenance of the *monopoly of machinery*, by aid of which the people of the world have been compelled to make their exchanges in her factories.

If such a course would, under any circumstances, be absurd, how much more absurd is it in a case like the one under consideration, where the power of purchase is so small, and so little capable of increase. Whatever goes to England must be there consumed, unless it can be forced off by means of low prices; and for what she consumes, be it much or little, she has $4·32 per head of her population to distribute, in the form of cloth and iron, among the farmers and planters of the world. It is a Procrustean bed, and the misfortune of the poor farmers and planters is, that whatever she cuts off from the portion sent to her is, as a consequence of the system, cut off from all the crop.

The producers of the world have been, and they are now being, sacrificed to the exchangers of the world; and therefore it is that agriculture makes so little progress, and that the cultivators of the earth, producers of all we consume, are so universally poor, and so generally uninstructed as to their true interests. The day, however, cannot be far distant when our farmers and planters, at least, will be satisfied that their interests cannot be promoted by a system that separates the consumers from the producers, and renders cloth and iron so costly as to cause the average amount of the consumption of either to be utterly insignificant.

The object of protection is that of diminishing the distance and the waste between the producer and the consumer; thereby enabling the producer to grow rich, and to become a large consumer of cloth and iron. That it did produce that effect is obvious from the immense increase in the consumption of both in the period between 1843 and 1847. That the facility of obtaining

iron enabled the farmer to improve his mode of production and obtain large returns is obvious from the fact that the supply of food increased so rapidly. That the free-trade system produces the reverse effect, is obvious from the great reduction in the consumption of iron in the years 1842 and 1843, and from the reduction now going on; the whole consumption of this year not equalling that of 1847, notwithstanding the vast increase of population.

The producers of food throughout the world have one common interest, and that is to be promoted by the abolition of the existing *monopoly system*, which tends to destroy themselves and their customers.

The farmer is also a *producer of wool*, and therefore I will briefly allude to that interest.

If we desire evidence of the truth of what has been said in relation to food, it may be found in the condition of the wool market for several years past. Our production is less than our ordinary consumption, and the consequence is, that the price is *higher* than in any country of the world, by the whole amount of the cost of transportation.* Close the woollen mills, and the price must fall to the level of the markets of Europe, *minus* the cost of exportation. The increased supply then would, as a matter of course, produce a fall of prices, and then the sheep grower would be ruined.

The changes of policy of the last twenty years have several times ruined the woollen manufacturers, and the sheep growers have as often exterminated their flocks; the consequence of which is, that we have less than 30,000,000, when, if the policy adopted in 1828 had been maintained, we should now have 100,000,000, and a market for their whole products at higher prices than now; for the prosperous labourers, miners and mechanics, cotton-growers and food-growers, would then consume six pounds where now they consume but three, and the number of our population would be greater by 7,000,000 than at present. The discord that now exists is the result of the "war upon the labour and capital of the world" maintained by England, and when peace shall have been restored by the abolition of the monopoly, it will be found that, between the interests of the sheep-grower, the producer of food, the miner and the mechanic, there is perfect harmony.

[Although thoroughly impressed with the paramount importance to every landholder, of being well informed as to the nature and extent of his concern in the *tariff-policy of the country*, and well satisfied that all other influences, bearing on the agricultural condition of every nation, are comparatively unimportant, yet the fear that our readers, generally, may not yet fully go along with us in our estimate of that influence, restrains us from devoting to the subject as much of each number as we are fully persuaded we should be justified in doing—yet why should even those who have not yet realized our conception of its magnitude, or share our opinions, complain?—seeing that we still reserve a greater number of pages than most other agricultural journals give to practical subjects. The fact is, we did not intend to follow in the usual track of such journals, for it was too ably, and had been too long occupied already. We want to lead the landholder and land-tiller to see what is really the connection and bearing between his and other different industries, and how it is

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* Much of the wool that was sent to Europe was returned, the price abroad being less than the price at home by more than the cost of transportation. Such will be the case with food, when the farmer shall make a market on the land for all the products of the land.

to the last degree interesting to him, that they should be as multiplied, as prosperous, and as near to him as possible; for therein, after all, lies the great secret and source of agricultural prosperity and improvement. We have yet in reserve, essays to show how protection affects the *cotton*, the *tobacco*, and the *sugar-planter;* the *land-owner*, the *manufacturer*, the *capitalist*, &c.—*Ed. P. L. & A.*]

AN ESSAY ON THE CONDITION OF A STALLION.

The word *condition* is used by horsemen in a different sense from that in which it is understood as applied to cattle by the mass of farmers. By *condition* the farmer often means a high state of fatness; the horseman, on the contrary, makes use of the word to indicate the greatest health and strength produced by *reducing* all superfluous fat, bringing the mere flesh into clean, hard and powerful muscle, and invigorating the lungs and other internal organs, so that they may promptly discharge their respective functions, and suffer no damage from uncommon stress—the whole in order to the animal's performing labors and sustaining a continuance of action to which he would not be adequate without such especial preparation.

By the *Condition of a Stallion* is meant the state of the system in which the male horse should be kept, in order to deriving from him the greatest excellence in the progeny.

Too many persons are content to breed their mares to a horse whose figure suits them, without regard to his *condition.* The mention of one prominent instance alone will be sufficient to show that good condition is essential to the production of a valuable progeny. A remarkable case occurred in England some years since, in so high a quarter as to attract public attention, and consequently the fact of the account's obtaining currency without contradiction is a fair evidence of its correctness. The Prince of Wales, who afterward became George the Fourth, owned, and was in the habit of riding as a hunter, an entire horse of unequaled excellence. In consequence of this horse's superior qualities, His Royal Highness caused a few of his own mares to be bred to him in the spring, after he had been kept in the highest condition as a hunter throughout the winter, and the produce, on growing up, proved every way worthy of their sire. When His Royal Highness, as Prince Regent, became seriously engaged in the cares of Government, and therefore relinquished the pleasures of the chase, being desirous to perpetuate the fine qualities of this stock, he ordered the horse to be kept at Windsor for public covering, provided the mares should be of the first quality; and in order to insure a sufficient number of these, directed the head groom to keep him exclusively for such, and to make no charge, with the exception of the customary groom's-fee of half a guinea each. The groom, anxious to pocket as many half guineas as possible, published His Royal Highness's liberality, and vaunted the qualities of the horse, in order to persuade all he could to avail themselves of the benefit. The result was, the horse being kept without his accustomed exercise and in a state of repletion, and serving upward of a hundred mares yearly, that the stock, although tolerably promising in their early age, shot up into lank, weakly, awkward, leggy, good-for-nothing creatures, to the entire ruin of the horse's character as a sire—until some gentleman, aware of the cause, took pains to explain it, proving the correctness of their statements by reference to the first of the horse's get, produced under a proper system of breeding, and which were then in their prime, and among the best horses in England.

Almost every observing farmer in this country has remarked that whenever, within his knowledge, an ordinary work-horse has, by chance, covered a tolerably good mare, the foal thus produced has, at maturity, almost invariably become a better animal than it was expected to be, and in many cases proved quite superior to the get of the high-priced and highly pampered stallions of the neighborhood. What was the cause of this? Condition. The work-horse, by constant and severe exercise, was brought into health and strength, and his stock partook of the state of his system at the time of copulation. Why is it that many experienced farmers, after having tried the best stallions within their knowledge, frequently resort to the keeping of one of their own colts or farm-horses entire, for the service of their mares, and actually obtain as large and as good and salable stock from such a one, as that from the public stallions of far superior size, form, blood, and all other qualities, except this indispensable *condition?*

It may be stated that, generally, whenever the get of a stallion has proved, at maturity, to be of remarkable excellence comparatively with the sire, such horse has been, at and previously to the time of getting such valuable stock, kept without pampering, without excessive sexual service, and with a good share of exercise or labor.

To show the effect of a peculiar state of the system in the parents at the time of copulation, instances may be cited from various sources. We will content ourselves with two—and first take a lamentable case in the human species as given in the valuable work on "The Constitution of Man," by George Combe:

"In the summer of 1827, the practitioner alluded to was called upon to visit professionally a young woman in the immediate neighborhood, who was safely delivered of a male child. As the parties appeared to be respectable, he made some inquiries regarding the absence of the child's father, when the old woman told him that her daughter was still unmarried; that the child's father belonged to a regiment in Ireland; that last autumn he had obtained leave of absence to visit his friends in this part of the country, and that, on the eve of his departure to join his regiment, an entertainment was given, at which her daughter attended. During the whole evening she and the soldier danced and sang together; when heated by the toddy and the dance, they left the cottage, and after the lapse of an hour were found together in a glen, in a state of utter insensibility, from the effects of their former festivity; and the consequence of this interview was the birth of an idiot. He is now nearly six years of age, and his mother does not believe that he is able to recognize either herself or any other individual. He is quite incapable of making signs whereby his wants can be made known, with this exception, that when hungry he gives a wild shriek. This is a case upon which it would be painful to dwell, and I shall only remark that the parents are both intelligent, and that the fatal result cannot otherwise be accounted for than by the almost total prostration or eclipse of the intellect of both parties from intoxication."

For another instance of a peculiar constitution derived from a parent at the time of copulation, and owing to a temporary excitement of the animal, a respectable farmer related to the writer of this Essay that he witnessed the effect of pain and nervous agitation on a stallion just before the moment of covering, in the production of a wild, timid, violent and worthless colt. The sire was in repute as one of the best horses ever kept in the district: and his stock afterward justified the opinion. The groom became angry and beat him in his stall in a cruel manner, and then led him out and allowed him to cover the mare, which was one of a perfectly quiet and orderly temper. The consequence was the production of an animal totally valueless, as above mentioned.

That the doctrine here held is no "new thing under the sun" is evident from many venerated authors. Plutarch says "The advice which I am now about to give, is indeed no other than what hath been given by those who have undertaken this argument before me. You will ask me what is that? 'Tis this, that no man keep company with his wife for issue sake, but when he is sober—as not having before either drank any wine, or, at least, not to such a quantity as to distemper him; for they usually prove wine-bibbers and drunkards whose parents begot them when they were drunk: wherefore, Diogenes said to a stripling somewhat crack-brained and half-witted, 'Surely, young man, thy father begot thee when he was drunk!'"

Shakspeare intimates the same belief in making a hero insult his enemies with the taunt "For ye were *got* in fear."

On no other known principle than this *condition*, or a peculiar state of the system at and before the time of copulation, can be explained the important fact which forms at once a criterion of skill in the scientific breeder, and a stumbling-block to the ignorant and unreasonable one, who would expect success without giving himself the trouble of investigating the natural laws which govern the subject of his operation: such a person is too apt to argue within himself that because the same parents at different times produce offspring of opposite characteristics, there can be no certain rules by which to create determinate qualities in the progeny; such a one would maintain that, because all the children of one married couple are usually somewhat different in characteristics from each other, there can be no means of predicting, with an approach to certainty, the qualities to be produced in the offspring by a particular sexual intercourse. Now this *law of condition* accounts for the difference between individuals produced at several births from the same parents. The case of twins, in the human species, serves to strengthen this argument, inasmuch as the two persons produced at one birth usually bear a close resemblance to each other, in all respects.

It is known that ideal impressions on the female parent, subsequent to conception, frequently take permanent effect on the offspring. That such causes do not usually give the leading characteristics to the progeny, is evident from these considerations:

1st. The consequences of such impressions on the female, are usually somewhat of an unnatural or monstrous order, being different from the traits of either parent, and from the common nature of the variety to which the animals belong.

2d. It is a settled point with breeders that the progeny is more strongly characterized by the traits of the male, than by those of the female parent. This fact is well known; and indeed it can hardly be expected otherwise than that the sex which bears so much the stronger impress of character, should impart the more visible resemblance to the offspring.

3d. It is an ascertained law of Nature, that peculiarities of climate, food, occupation and most other circumstances affecting the well-being of an animal, produce in its constitution a change such as is necessary for the welfare of the species; and that this proceeds throughout many generations, until the animal becomes completely adapted to the circumstances of its existence. [The same thing occurs in the vegetable kingdom.]

This last consideration, of the gradually altered state of an animal through successive generations, is a strong instance of the effect of *condition;* and it is by a regard to this invariable law of Nature, of self-adaptation to circumstances, that the cultivation or improvement of any breed is to be effected. "Hence the most acid and worthless grape is by skillful culture rendered sweet and luscious; flowers without attraction are gradually nurtured into beauty and fragrance; the cat may be made to present all the rich colors of the tortoise-shell, and the pigeon may be 'bred to a feather.'"

Let us now endeavor to deduce a useful, practical conclusion from the foregoing arguments. If our doctrine be correct, the horse-breeder will depend upon the *condition* of the stallion, in order to the procuring of valuable stock from him, as well as upon his other qualities of pedigree, speed, action, bottom, wind, temper, spirit, form, style, size, color, &c.

The next practical question is, how this condition is to be attained, and how the animal is to be kept at the required standard in this respect. The requisite *condition* is only to be attained by *training* for health and strength in a great measure according to the system of training for races: supplying an abundant nourishment of the best quality, allowing sufficient periods of repose for digestion, and giving regular and strong exercise, the whole with such variations as only experience and close observation, under constant practice, can dictate.

The aptitude of an animal to benefit by training is often inherited, like other qualities, from its parentage; and judicious breeding alone can insure a continuance of the desirable quality, or create a propensity for it by proper crossing, when it does not exist in the parents.

The age at which the horse is best adapted to undergo a course of training, is just at the close of his most rapid period of growth, while the system is in its

greatest freshness and vigor. This period is at about five years old. The powers of a horse will augment by suitable treatment in this respect until about the age of nine years: and, in order to obtaining the most valuable stock, a stallion should not be put to service before attaining a full development of his powers, nor kept at it after his form or energies appear to be affected for the worse. He should be, then, between five and fifteen years of age, if of an ordinary constitution; but if of remarkable energy and endurance, and exhibiting no symptom of debility, may be continued until past twenty.

Trainers find their endeavors to produce the highest state of strength, in an animal, greatly impeded by any excitement of the sexual appetite. It is then the more necessary to keep the horse in a state of training throughout the year, impressing most forcibly a tone of health and strength upon his system at the time when his nerves are liable to the least distraction; and continuing the course carefully throughout the season of copulation; never allowing such excess of service, or of the excitement of sexual appetite, as to induce a disturbance of spirit or temper, or a relapse from the most thoroughly strong, healthy and regular tone of the system. G. B.

Contrary to the system laid down by 'G. B.,' and which is urged with plausibility and force, the practice with too many is to keep the stallion through the season, as hogs are kept to carry them to the greatest possible weight in the shortest time, to which end it is deemed best to make them eat as much, and sleep as much as possible. Is it reasonable to expect a vigorous and sprightly offspring from an animal in that condition? The truth is that in the range of a farmer's occupations, there are few things that require more care and consideration and skill than in the department of *breeding his stock*. &c. Yet there are few in which less skill is possessed, or less consideration is exercised. For maintaining animals of various kinds, in their highest form and qualities of excellence, if the truth must be acknowledged, we have not among American husbandmen generally, the practiced judgment, the leisure, the conveniences, or the capital; neither have we the stimulus to close and persevering attention to be produced by the certainty of demand at remunerating prices. Hence the general deterioration which marks the descendants of choice imported animals—unless the Horse be an exception. To him our climate is particularly congenial, and improvement has been maintained by the high prices, still to be had from opulent men in the cities, for superior match horses. Another auspicious influence was that of the *turf*, but that declining almost to extinction, a corresponding effect will be visible after some years on the shape and powers of the Horse. We remember once, at the table of the British Ambassador, to have asked the late J. Randolph, of Roanoke, whether Virginia maintained her ancient superiority in the character of her horses; to which he answered, promptly, "No, Sir, far from it—far from it, Sir. Since we gave up horse-racing and turned up the whites of our eyes, our horses have sadly depreciated."

THE RHUBARB.—The leaf of the common garden rhubarb is a fine display of the order of vegetable nature. It is common to find them about two feet square, and containing over 500 square inches. We noticed a lover of Nature examining one a few days ago and making a calculation, the result of which, for its curiosity, we will give. He found that on the surface of the single leaf could be traced more than two miles of distinct canals through which the nourishment passed to give life and vigor to the leaf. These canals being about the sixteenth of an inch apart, divided the leaf into 130,000 fields, each as distinct to the eye as the division by walls of the grass and grain lands of the well cultivated farm. As lateral fibres, more minute than the unaided eye can discover, pass in close contiguity through these small fields, there is no doubt that could all the canals for circulation in a single leaf be extended in one line, they would reach the distance of ten miles.

We are glad to see that COL. CARROLL, of Maryland, has placed a stallion of the Black Hawk, Morgan breed, from Vermont, at Daughoregan Manor. The real Simon Pure Black Hawk, which we suppose to be the sire, is among the most perfect horses for "all work" that we have ever seen. But it may be hoped this one, too, will not be called "Black Hawk." By the bye—we claim to have been the first to insist, *a fortiori*, that the breed of Morgan horses, from their qualities, *must* be deep in the blood—and then to have traced that blood, and proved it, against the general persuasion—that it was a mysterious breed peculiar to Vermont.

STEAM-POWER FOR FARMERS.

THE EXTENDED APPLICATION OF THE STEAM-ENGINE, OR OTHER IMPELLING POWER OF THE THRESHING-MACHINE, TO FARM PURPOSES:

BEING EXTRACTS FROM AN ESSAY ON THIS SUBJECT,* BY ROBT. RITCHIE, F. R. S. S. A. &C.
Civil Engineer, Edinburgh.....Premium, Ten Sovereigns.

THE rapid advancement which Great Britain has made by the influence of her steam-power and machinery in manufactures, commerce, and navigation, has not been without a corresponding effect, though perhaps not to the same extent, in Agriculture. The proof of this is visible in the strenuous exertions made by agriculturists, of late years, to avail themselves of the use of machinery and improved implements of husbandry to economize labor. With the power of the steam-engine at command—although not now, perhaps, to the extent it may ultimately be made available—the British farmer has it in his power, at a moderate expense, on almost every farm, to lessen the labor of the barn, to extend its application to various useful purposes, and to place farm economics in a position of advancement which they have not hitherto attained. . .

By far the greater portion of the threshing-mills erected in the agricultural districts of Scotland are propelled by horse-power; but however convenient the use of the horse-walk and fixed threshing-machine was to the farmer, and justly considered, when introduced, as a great improvement in barn operations, and is yet esteemed so, still it has not been without its inconveniences; but when contrasted with the laborious employment of the flail, yet so generally in use throughout the world, its greater expedition and efficiency become apparent; and, when we consider that the use of the flail was better than the feet of animals, we may be enabled to form some idea of the value of the horse-mill to farm purposes. Still, of later years, the intelligent farmer has hailed, with much satisfaction, the application of a new impelling power to the threshing-machine—a power whose dominion extends over every branch of the arts and manufactures of our country—which has given an impulse to modern nations, a command over the produce of every climate, and of which the most learned nations of antiquity never could surmise.

The application of steam-power to farm purposes seems by far the most important improvement which has been made, connected with Agriculture, in these times, and must, from its obvious advantages, soon supersede every other power, except, perhaps, in a few isolated situations, where an ample water-power can be obtained, or where the smallness of the farms make it unimportant.

It is a good many years since steam-power was first applied to farms in Scotland, and, in the borders of England, in some few instances, from twenty to perhaps thirty years; but it is only within the last ten or fifteen years that it has become general, if it can even be said to be yet in general use.

The advantages of the steam-engine over wind, as the impelling power to the threshing-machine, appear to be, that it is always at command, and ready to perform the work required by day or night. Its advantages over water-power are, that neither heat can dry it up nor cold freeze it. Its advantages over horse-power are, that the motion is more regular and the work must be better done; for horses, in the threshing-mill, generally pull unequally, while the strain upon the limbs, in this severe work, proves injurious to them. When the farmer, too, has always his horses fresh and ready for the field, he can do more work with fewer horses;* and if a pair or more can be saved, it is an important item to him.

One manifest advantage of steam, as the first mover of machinery, arises from its rapidity and certainty. If the farmer, therefore, can bring his grain on the shortest notice into market—if he can either thresh one stack or a dozen without stoppage, and so avail himself of any sudden rise in the market, without delaying or retarding the other operations of the farm—he possesses advantages invaluable, though no other were attained—advantages which no other means of threshing can give him. But steam-power likewise possesses that steadiness of action which cannot be obtained while employing the horse, and a much greater quantity of corn can be threshed in a day. The usual quantity of corn threshed by a six-horse steam-power, is at the rate of five quarters per hour, but four quarters may be taken as the general quantity to thresh easily; however, the quantity must vary according to the grain and straw. If the average of horse-power, as generally driven, be taken at thirty quarters per diem, the average of steam-power may be taken at fifty quarters, giving an advantage of twenty quarters in favor of steam-power, while the latter is kept up at no other expense, save fuel of the cheapest description—culm or dross is generally used—and, unlike the horse, when not working, *costs nothing!* hence, in every point of view, the use of steam-power on farms must prove advantageous.

The author of the excellent Treatise on Agriculture in the last edition of the *Encyclopædia Britannica*, seems to have fallen into an error when he says, "Wind and steam-power require too much expense for most farms, and that the use of steam must be confined for the most part to coal districts." From the recent

* The author, by permission of the Directors of the Society, intends shortly to publish this Essay entire, with drawings fully explanatory of the different kinds of engines used on farms, mode of attachment to old mills, and connected with subordinate machines; with a historical sketch.

* The saving of a pair of horses to the farmer has been estimated at fully £100 per annum. Some farmers tell me, who have steam-power, that they can save a pair of horses out of four, on large farms.

date this article has been published, this opinion might not have been expected, if referring to the agricultural districts of Scotland. It may be presumed, therefore, the opinion has been inadvertently given, and if the author had entered more fully into the consideration of steam as a motive power, he would certainly not have classed it with wind-power. Indeed the rapid extension of steam-power to farms speaks volumes in its behalf. He would have found on investigation the immense benefit of the application of the steam-engine at a *very moderate expense to the farm*. A power which only requires to be understood to be more appreciated, and what almost every farmer who has used it has found to be one of the most advantageous improvements he has made on his farm-stead; and, while it increased his comfort, it was attended with no difficulty in the management, requiring no other attention than what any farm servant could easily give.

This power indeed, as applied to Agriculture, is yet in infancy; but with a prospect of gigantic manhood before it, it seems fitted in all probability, as it becomes more extended in its range of application, to change the entire face of the country, and give the same impetus to Agriculture, which it has done to all branches of the Arts. No well-informed farmer should be insensible to the value and utility of the steam-engine, even limited as it now is as a moving power to the threshing-machine, and the adoption of this power by him, in most instances, in the best agricultural districts of Scotland and borders of England, evince beyond a doubt, that it, in his opinion, is the best and most advantageous power which has been yet applied, wherever there are not insuperable obstacles intervening; and it shows how readily the enterprising farmer avails himself of whatever improvement enables him to support competition and improve the capabilities of his farm.

In England, *fixed* threshing-machines have not been much used for farm-steads, hence stationary steam-power mills are rarely to be met with. This may arise from a variety of causes without the value of these being overlooked by the various public-spirited agricultural associations scattered over the south. It cannot, however, be supposed, as its advantages become better known and understood, that the application of steam-power to farms, both in England and Ireland, will not in time become as common as in Scotland, where it has extended with amazing rapidity.* The threshing of grain with machines in England is generally carried on with portable mills wrought by horses; the threshing of grain being in some counties a regular branch of trade, the thresher removing his machine from farm to farm. Recently, steam-power has been strongly recommended at agricultural meetings (at the late show at Derby and other parts) for this purpose, and is now getting into use. The Disc Engine Company of Birmingham have invented a very compact portable engine, boiler, and threshing-machine, on a carriage. The whole machine provides for its being readily moved to different farms. Mr. A. Deans of Birmingham has also made, for a similar purpose, several forms of portable cylinder and piston engines, some with upright and some with horizontal cylinders. These engines are of different powers, from four to six horses', and the engine is placed on a neat iron carriage.—The whole occupying very little room, requiring no chimney-stalk or brickwork, and is drawn from place to place by one or two horses. It may be worked, he states, in the field or anywhere, without any fixing, for threshing corn, cutting chaff, and other agricultural purposes.—Mr. Deans' inventions are clever, and many of them will be found useful. His portable steam-engines, with patent irrigator and fire-engine combined, adapted at the same time for driving threshing-machines, pumping and draining, is deserving of the attention of the farmer. These applications are all very suitable for small farms, and dispense with the laborious employment of the flail. But the advantages of a fixed threshing-machine, and steady and cheap motive power, under the command of the farmer at all times, are so palpably apparent, that the only wonder can be how the farmer of land, to any reasonable extent, can do without it, as the want of it must place him under many disadvantages.

In the following remarks, respecting the subordinate purposes to which the prime or impelling power can be advantageously extended at the farm, the observations shall be confined to steam-power, although it will be easily understood that many additional uses to which this power can be applied may equally well suit any impelling agent of machinery in which there is a surplus power.

Before entering on this subject, it may be proper shortly to describe the form generally adopted, and give an example.†

In most of the new onsteads, where steam-power is used, the engine-house is generally an outshot from the barn. The boiler of the steam-engine is supplied from a well sunk at one side of the engine-room. This is the general plan with stationary farm-engines, and the back or surplus water from the boiler is returned to the well, the water being usually moderately heated before entering the boiler. But when well water cannot be obtained, which often happens in coal districts, a pipe is led to a cistern, from the nearest pond, from which the engine pumps the water directly into the boiler; or the engine may be made to pump the water from the pond at a moderate distance; but this is just taking so much power from the engine itself. It is desirable always that the pump throws up an ample supply of water, when high-pressure engines are used, to prevent, from negligence, the risk of overheating and burning the sides of the boiler; of course, with condensing engines, a much more abundant supply of water is indispensably necessary: hence the non-condensing engine has been in many cases adopted, from the smaller quantity of water it requires. The engine, about seven horse-power, is on the non-condensing principle, with over-head crank; and the attachment of the power to the mill is extremely simple. The threshing-mill itself possesses every modern improvement. There are elevators to lift the grain to the hand-fanners, and elevators to repass the refuse through the mill; both of which are likewise worked by the engine-power; likewise a corn and bean bruiser, which admits of being attached or detached at pleasure. The steam-engine has been several years in use,

* The Report on the Advantages of Steam as a Motive Power on Roads, by the House of Commons, is strangely coincident in the same reasoning.

† In the following remarks it is barely possible to be intelligible without sketches of the drawings which accompanied this Essay, except by those who are conversant with Scotch farm-steads; but as the paper and drawings will be subsequently published, reference can be made to the book.

and is most perfect of its kind, (it was made under my own direction,) and is capable of driving easily the threshing-machine and machinery connected with it, and also any additional machines which the farmer may find for his advantage to attach to it.

Another example is given, showing the connection of the steam-engine with a very complete set of farm-offices. This is entirely new, and would easily admit of subordinate machinery, if desired. This steam-engine is also of high-pressure or non-condensing, excellent of its class, and capable as it ought to be, of doing more than the work required of it. The neatest arrangement, however, of the steam-engine house and boiler, is when these buildings form a part of the range itself of the farm-buildings, and not an outshot from it.

But, in truth, there is no end to the different plans which could be adopted by a skillful farm-architect or farm-engineer; and it may be said every farm-stead requires a separate design to suit the locality and wants of the farmer. There are no parts of Scotland where so many snug, compact farm-buildings can be seen as in the neighborhood of Edinburgh, the accommodation is ample, without being superfluous. So rapid, indeed, has been the extension of steam-power to farms in this vicinity, that from the fine elevations round Edinburgh, more than 100 steam-engine stalks or chimneys may be observed as the landmarks of the farm, and giving a peculiar feature to the landscape.

Although the subordinate purposes to which the impelling powers of the threshing-machine have as yet been extremely limited, yet it admits of no doubt, if under proper control, it may be applied to a variety of useful purposes to which it has not as yet been applied, beside that of threshing grain. It is, therefore, of importance to consider the most simple and economical way in which the subordinate machines can be connected with the impelling power.

To the bruising of grain the power is commonly applied, and that most advantageously to the farmer. It has also been applied to chopping of hay, slicing of turnips, grinding of rape-cake, working a butter-churn, and driving circular saws; to these, and perhaps many other purposes, the first power has already been at different farms applied. An inconvenience however, arises—although, perhaps, of no very great importance—when the smaller machines are used, that they cannot be driven except when the threshing-mill shaft is set in motion, as the axle or shaft of the steam-engine connects the first power with the mill, and, if worked with belts, from a separate shaft; this latter shaft cannot be set in motion until the main engine-shaft, which connects engine and threshing machine, is going. When subordinate machines are used, worked by steam-power, they should be so contrived that the mill* may either be worked at the same time, or taken out of gear, and the machines worked or driven independently of the mill. This may be attended, perhaps, with more expense in the first erection, but it is more complete, and will, on most occasions when used, save a loss of much steam.

Several examples might be adduced in explication of these points. At one of the first steam-powers, for a large farm, put up in West Lothian, the steam-engine can either drive the threshing-mill in conjunction with grinding-mills for meal and flour, or the latter can be used by themselves. The machinery can be detached or taken out of gear at pleasure, and the whole is of the most perfect description. In such a case as this, the steam-power must be ample, which it is in the instance alluded to.

In another example of a simple description, in Mid-Lothian, an engine of eight-horse power, non-condensing, is regularly in use for a saw-mill, while, at the same time, it is the motive-power of the threshing-machine. The force is communicated to the saw-mill by means of a large cogged wheel placed on the main shaft, between the fly-wheel and engine itself, driving two circular saws. The power is taken from, or given to, either threshing-machine or saw-mill at pleasure, by means of pinions or small wheels. Cut wood is manufactured here to a considerable extent, which shows how easily the steam-power can be advantageously employed, and to do also the work of the threshing-machine.

It would be tedious to go over the various skillful applications which have already been made use of by enterprising farmers in the agricultural counties round Edinburgh. The subject is *new*, and, perhaps, but in infancy. Of course a great deal remains to be done by skill and ingenuity before such plans are extensively adopted; but I have little doubt as the value of steam, as before stated, becomes fully known, as the *best* PROPELLING POWER FOR THE FARMER, endless may be the applications of it even to farm purposes.

One of the best examples I have yet met with of the acknowledged utility of subordinate machines worked or driven by the first power, is at a fine farm in East Lothian. The steam-engine which drives the threshing-machine is a neat condensing-engine, but only of six-horse power. In addition to working elevators and dressing fanners connected with a complete threshing-machine, a shaft or axle—taking the power directly from the main-shaft of the mill—is led through the barn, which, by means of drums and belts, is made to work a corn-bruiser, barley-hummeler, and fanners, and likewise a pair of stones for a flour-mill, and a mill for grinding rape-cake; and, by an additional shaft, a circular saw. The whole of the machines are so arranged that they can be driven alternately, and the flour stones are let off to a neighboring miller, thus proving the economy of the arrangement. In addition to these machines, the spare steam from the boiler is made to heat a *drying-loft*, which is placed over the boiler-shed, on the floor of which small tin or iron pipes are laid, heated by steam from the boiler. These pipes are protected by a grating of wood, and the whole covered with hair-cloth. Damp grain is here dried with the greatest facility; and in wet seasons the drying-closet or room is found to be of great utility.

Indeed, the whole arrangement at the farm displays much skill and ingenuity; and we could not have a better example of a *small power* with which so many subordinate machines can be usefully employed without great trouble or expense.

I might give several more illustrations from *other farms* where great ingenuity has been displayed in economizing labor by machinery; but I think it unnecessary, as the one I have given is among the best instances I have met with where the advantages of such means were

* The word mill is used indiscriminately for threshing-machine.

duly appreciated and early adopted. However, it may be said that, in general, the impelling power is *strictly confined* to driving the threshing-machine and connections of it. Indeed, unless the steam-engine has ample power, it would be useless attempting to work more than the mill at one time; but we see, if the power is judiciously arranged, that even a steam-engine of *only* six-horse power can be made of powerful avail to the farmer.

It seems singular that the farmer of the present day does not turn more attention to these useful applications of ingenuity so advantageous to himself, of which I have given so striking an example; for, when we turn to the century that is past, which we are so apt to deride for its want of mechanical contrivances, and think so much behind the present age, we shall find much to admire if we have the patience to investigate. If we turn to the works of Dr. Stephen Hales, F. R. S., and other writers, farmers will find much curious and useful information. His plan of keeping corn sweet in sacks was considered of great benefit to farmers. A hollow reed or cane, perforated with 200 holes, was placed in the sack, and the nose of a common kitchen bellows placed into a wooden faucet attached to a leathern pipe ten inches long, distended by a spiral wire fixed to the top of the stick. Each stroke of the bellows would discharge a quart of air, sixty-four strokes per minute would convey a quantity of air equal to the capacity of a four-bushel sack. With the steam-power at command at the farm to drive a blowing-fan, such a scheme as this could be easily adopted by the farmer, and still exceed the plan of preserving corn by ventilation, which was much thought of at the time, although ventilators of a much simpler construction can now be readily applied for the purpose. It is stated (in the *Gentlemen's Magazine*, 1749) that the ventilators contrived by Dr. Hales for preserving corn were so much esteemed in France that M. de Humel de Monceau, a Member of the Royal Academy of Sciences, preserved a large heap of corn free from weevils for two years, without turning it, merely by *blowing air up through it.* He likewise procured a large granary to preserve, in the same manner, with ventilators worked by a wind-mill, quantities of corn, with a view of making it a general practice in France. Dr. Hales also applied his ventilators very usefully for sweetening milk when ill-tasted, also for water, by blowing showers of air through it. His ventilators in dairies would be found advantageous. If such was the knowledge of these matters in the last century, it seems singular how little has been really done to follow out the experience they acquired; yet it is not the less curious to observe the coincidence that so often happens between past and present inventions; for the plan I have described, as applied for drying grain in East Lothian, is a counterpart of the very plan recommended by Dr. Hales for drying malt, hops, &c. only the latter had the advantage in recommending blowing fresh air upward through wooden bars, "*or large laths, nailed to the floor, and hair-cloth to be laid on them.*"

While, therefore, improving the present inventions, do not let us overlook the past, and claim, as new ideas and inventions, what may have been known and applied centuries before. Let the information and appliances of the past be acknowledged as so much experience gained, and incorporated with the superior advantages in mechanical construction of the present times.

In applying the steam-engine power to subordinate purposes, and mixed machinery at new farm offices, there is more scope for the exercise of skill and judicious arrangement on the part of the farm-architect and engineer than when steam is made use of at old farm buildings. The method of connecting the first power to the machines, likewise admits of difference of opinion. It is sometimes done by belts and sometimes by cogged and beveled wheels. Although there is more friction by wheels, they are generally preferred by engineers, as belts are apt to slip, and cannot be durable, instances being found where in places in barns, or places infested with rats, they are even destroyed by these vermin. All main shafts or axles are invariably preferred to be connected with wheels, and likewise in connecting subsidiary or minor shafts to the first mover, wheels are made use of, although, in many instances, belts must be had recourse to, and, by having several shafts to lock and unlock to the main crank shaft, or to go easily in or out of gear, a variety of useful machines may be driven by steam-power at every farm at which steam is made use of.

At new farm buildings, in addition to driving the threshing-machine, the whole array of the minor implements or machines of the barn, and machines for preparing food for cattle and horses, machines for working the dairy utensils, machines for preparing artificial manures, machines for pumping or irrigation, by means of hose, machines for preparing grain for food, and machines for giving warmth and ventilation, might all be attainable, and easily made applicable at every farm, by means of steam-power.

Although such machinery may at first view appear *complicated*, yet in *reality* it *is not so*, and might be made of very easy management. I need not enter into any minute description of the methods of applying such subordinate machines as may be thus adopted. The details must be left to individual skill to execute. It is sufficient here that I suggest and point out the practicability of easily following out the suggestions made. With this view, the germ of such an arrangement of subordinate machines, applicable to the various purposes above noticed, I shall briefly describe.

A steam-engine of ample power (suppose six, or eight, or ten-horse power, for farms varying from 250 acres and upward) is erected, in the first instance, to drive the threshing-machine, and is supposed to be in daily use, as the *extended* application of steam-power *implies that the* farmer will find it to his advantage to make use of the engine almost constantly, or, at all events, in winter, to have the fire on the boiler. To be of real utility, the power must be generally available or at command, at least more frequently in use than *presently* done, where the engine and boiler remain a dead letter except when threshing is going forward; and where the refuse of coal or culm can be readily obtained, as in coal districts, there can be little apology wanted for not having the boiler regularly in use, which should be constructed on the most economical principles as regards fuel. The construction of the boiler is of most paramount importance in farm-engines, both as regards economy and safety. We have seen what has been done in locomotive engines, by industry and economy in fuel, shown fully in Mr. Macneil's evidence before the House of Commons in 1832. The evidence of Mr. Macneil in con-

vincing the Committee that experience will soon teach a better construction of the engines, and a less costly make, and generally a requisite supply of steam. When the steam-engine was not required for the purposes of the barn, it might, perhaps, in many farms, be advantageously employed for the purposes of pumping and irrigation. Supposing the engine, therefore, to be nearly in daily use, and having every modern improvement, and the threshing-machine of similarly improved construction, with elevators, hummeler, corn and bean bruiser, &c. &c. By a direct shaft from the steam-engine, with the power of attaching or detaching, taking in or out of gear at pleasure, meal or flour mill stones are applied, these, if inconvenient, to be worked by the farmer, or, if the corn-mill divides his attention too much. I have given an example where the spare power of the engine was let off to a neighboring miller. In several instances, however, I have met with farmers who advantageously made use of flour, barley, or meal mills at their farms, and if not used for grinding, a pair of stones would be found of great advantage for bruising grain, and several have been applied for this purpose in the south of Scotland and in Northumberland, at large farms, as much more powerful than the common corn-bruising rollers. From the same shaft a rape-mill, an oil-cake crusher, or even a malt roller, could be easily applied, and a circular saw be driven, and, if thought requisite, a bone-mill could likewise be wrought by the same shaft, and in many farms found useful for "converting ashes, and a variety of otherwise useless rubbish, into fertilizers." Another shaft passing through the straw barn could easily work a straw and hay cutting machine, and also a turnip and potato slicer. The former could be conveniently placed in the stable court (at no great expense a hayloft might be made above the straw barn) and the latter could be placed very conveniently near the cattle court, at the turnip court, or, if preferred, the straw-cutter could be advantageously placed there, instead of the turnip slicer, as these are found so useful in the field.

Other minor machines could easily be driven from these two shafts as they pass through the respective barns—such as a butter churn for dairy purposes. I have not dwelt much on machinery for dairy purposes, because dairy farms, on a large scale, are rarely combined with grain farms. However, as every farmer is more or less connected with feeding cattle and making butter and cheese, it must be obvious that the command of steam-power gives many advantages, and points out how the female department of the household can be saved much useless labor, and their attention turned to more profitable purposes. Thus the labor of churning by the churning-machine worked by steam-power will enable a great deal more work to be done in much less time.

In addition to the machines I have noticed at the general farm, I may mention that a very simple contrivance might construct a *tram*-way and wagon to the threshing loft, by which the engine could be made to *draw up* the grain to supply the threshing-mill, and *return down* the empty wagon, saving much manual labor. Elevators for grain could also easily be constructed to *lift up the grain* to the granary, and lower it upon the carts, wrought by the steam-engine.

The above are a few out of many practicable purposes to which mechanical science may be made to economize human labor, and render the exertions of the *farmer* more advantageous to himself. But a new element is mixed up with the applications of the steam-engine to farms, which, in another point of view, gives it still greater advantages, and these of a practical kind. I allude to the use *which can be made* of the *steam itself*.

A steaming apparatus is a necessary appendage to every farm of a moderate size, and its utility is very generally appreciated. The steam is commonly raised by a separate boiler, but very little skill would be required in applying the steam from the engine boiler to a complete steaming apparatus for cattle. The objections of the steam not being in constant use I have already alluded to. Where, indeed, the farmer is *resolved* merely to confine his steam-engine to threshing of grain, of course a portable steam-power would not apply—it would be inexpedient, perhaps, to draw steam from his engine boiler, or even put water for boiling turnips in wintering cattle. But the time will soon be past when the farmer will cease to be told, "What a pity it is you cannot make use of your steam-power, except merely for threshing, after going to so much expense for its erection—it is thus useless to you (keeping it idle) two-thirds of the year." As I have said, a test for the ingenuity of the farmer is to be shown, and he will be judged of as the cleverest and most practical farmer whose skill has brought out the most numerous and useful applications. Hence, in this light, steam-power is to be judged of not merely as a *motive power*—which water can as cheaply perform, or which, some day, electro-magnetism* may, perhaps, as cheaply effect—but as possessing advantages *per se*, which I shall attempt shortly to point out. The boiler of the engine, which ought to be no longer than really required to give *steam enough* to prevent waste of fuel in winter, must be daily regularly heated, and then either steam from it, or hot water, as may be required, is to be obtained for preparing food for cattle. It is likewise to be made equally available for stable use. The advantages of having hot water *at all times* in stables is appreciated by every gentleman who takes an interest in his stud.† The spare steam can be made easily to heat a complete range of cottages for farm servants, which may be situated in connection with the farm offices as not to be inconvenient.

We have already seen the facility by which the spare steam was made use of, at a very small expense, to heat a drying loft; even the heat of the boiler itself might be of utility for damp grain placed above the boiler shed, as is frequently done for drying-houses of manufacto-

* Although there is little prospect at present of electro-magnetism being brought into use in this country as a moving power of machinery, yet it is stated it has already been brought to considerable advancement on the Continent—and the very ingenious applications of this powerful agent by Mr. Daniels, and others, holds out a decided prospect of its more extended applications. A very clever model of a machine, driven by electro-magnetism, was shown at one of the Highland and Agricultural Society's monthly meetings, by Dr. Aiton of Dolphington, and an interesting account read by him of the application of electro-magnetism to machinery.

† In some stables the whole range of sleeping-lofts or apartments for the grooms were heated, under my directions, by hot-water pipes or steam; likewise water tanks, or cisterns for the stalls, were heated by hot pipes passing through them

ries. The utility of this plan must not be overlooked in making arrangements for using steam-heat, nor likewise the simplicity by which the same agent could be applied for a clothes-drying house for family use. Nor must we forget the advantages of heating poultry-houses with spare steam-heat, or even the poussiniere, or nursery for egg-hatching. Nor is this chimerical—the poussiniere of M. Bonnemain, invented fifty years ago, heated by hot-water pipes, or steam, we are told, was found to be an ingenious and profitable establishment; and this plan, as old as the Egyptians, while it has been revived within these few years, affords to the busy housewife, where her spouse has laid out a few pounds on the erection of a steam-engine, or steam-mill as it is called, or boiler, an ample supply of heat for bringing chickens in winter into market, to reward her with a profitable investment. The above are merely a few things of the many this powerful agent can be made to do, even on a small scale; nor must I forget, for the housewife, the washing-machine, both *driven* by steam-power, and *supplied* with steam, and other excellent applications of steam, many of which will be found described (as they have been practically applied) in Silvester's Domestic Philosophy.

The great distance to which steam can be conveyed from the boiler would excite surprise to those who have never seen it; hence there could be no difficulty in applying it, in addition to what is stated, to many horticultural purposes—such as warming a hot-house and conservatory, and pine or melon pits, or even forcing land, or garden ground. The daily new inventions and purposes to which it is applied point out an inexhaustible field for extension.

But the utility of the steam-engine is not practically exhausted: the boiler chimney could be made of the greatest utility for an important purpose—*ventilation*—a thing so much neglected in most arrangements. The whole range of stables, cattle-sheds, and even piggery, grain lofts, &c. could be brought under a perfect system of ventilation by the fire draught, by means of metal or wooden pipes, or brick or stone flues, communicating with the ash-pit of the furnace—a plan which has been long known,* yet so little practically made available. The importance of ventilation to stables, though generally admitted, is frequently neglected. Although we have many examples on record, especially in horse-barracks in the army, of the evil consequences of bad ventilation—as all animals, when confined, rapidly destroy the atmosphere, both by respiration and secretitious exhalations from the skin—producing carbonic acid, and other ammoniacal and mephitic gases. Hence the lower animals require *even more air* in the same ratio than the human race; and, to keep horses, cattle, poultry, sheep, pigs and dogs in a healthy condition, and free from cutaneous diseases, when much confined, besides wholesome food, a constant renovation of the air should go on; and even in stables, if heat is required, which it must be, it is surely better to provide artificial heat, by passing a steam-pipe through the stable, than by enclosing the animals in a loose box heated by their own exhalations, or by closing the stable up, to allow them, as it is termed, to draw heat from one another. I do not think sufficient attention is ever paid, in the construction of stables and cattle-houses, to the necessity of ample *light* as well as *air*. The effect of want of light on vegetables and plants is so well known that there can be no doubt light is equally required for the health of man and the lower animals. In addition to the stables, &c. the same range of cottages which I have shown could be so easily heated with spare steam, or hot water, from the engine-boiler—could, with equal effect, be ventilated by flues drawing or sucking out the impure air to the furnace—or if the fire draught was found inconvenient, or thought objectionable, as has been said, for "attenuating the air," then the wind fan could be driven by the steam-engine, to effect the same purpose. In all and every case to which ventilation is applied, whether to suck out the impure air from cottage or stable, provision is to be made for the inlet of fresh air, as well as the escape of impure air. Thus, with a little expense in the first arrangement, farm-house, cottages and offices could be placed under a thorough system of ventilation—under perfect control; and the same agent which effected this would supply, without more cost for fuel, an ample supply of heat to warm with salubrity many cottages; even ample supplies of warm air, if preferred, heated by steam, might be distributed, thereby increasing the comfort of the cottage fire or the farmer's hall.

In addition to all this, an agent so accessible as the engine chimney might be applied to other useful purposes—to preserve the roof and timbers of the buildings, as well as so contrived that a flue from each stack in the yard might create a circulation of air in wet weather, and prevent the heating of the grain in the stack.

I might pursue this subject still farther, but I am well aware that even much of what I have already suggested the farmer may be apt to regard as chimerical, and inconvenient for him to adopt in practice. This I am prepared to expect. But opposition of this kind goes for nothing. It is like the slow-sailing ship in the wide sea, which is soon distanced by more active competitors. When we remember the state of the Scottish farms of old, and contrast them with the improved state of modern tillage, and knowledge of chemical properties of soils and manures, we may observe what a few years have already produced, and what a prospect of progressive advancement is still held out. I agree with Mr. Babbage "that Science and Knowledge are subject, in extension and increase, to have effects quite opposite to those which regulate the material world: the farther we advance from the origin of our knowledge the larger it becomes, and the greater power it bestows upon its cultivators to add new fields to its dominions. . . . The mind contemplates the past, and feels irresistibly convinced that the whole already gained bears a constantly diminishing ratio to that which is contained within the still more rapidly expanding horizon of our knowledge. . . . The experience of the past has stamped with the indelible character of truth the maxim that '*knowledge is power.*'"

[Journal of High. and Ag. Soc. of Scotland.

* See an account of this, in a paper read by the writer before the Royal Society of Arts, 10th April, 1843; and printed in the Society's Transactions.

BURNT CREAM.—*Prep.* Cream, 1 quart; cassia, a small stick; the peel of half a lemon; boil for 5 minutes; let it cool a little and take out the spice; then add the yelks of 9 eggs, and sugar to sweeten; stir until cold, put it into a dish, strew powdered sugar over it, and bake it until brown.

ON THE ART AND USEFULNESS OF BUDDING.

As no time is to be lost by those who propose to provide themselves with choice fruit of every sort by this beautiful process, we have decided to devote to it as much space as may be necessary to enable the most inexperienced to perform the operation.

The season most appropriate for it, according to English writers, extends to the last of August, but the best American authorities say that budding may be practiced in this country to the middle of September. The simple rule, however, is, that it may be done at any time that, and only when, the sap flows so freely as to admit of the bark being easily separated from the wood of the stock to which the bud is to be attached.

Budding, we need hardly say, is the art of making the bud unite to the stem or branch of another tree or shrub. Delicate kinds, says Johnson, are strengthened by being *worked*, as it is technically termed, upon more robust stocks.

A bud contains the rudiments of a plant, or of part of a plant, in a latent state, until season and circumstances favor its evolution. A close analogy exists between a bud and a bulb, which is also a reservoir of the vital powers of the plant, during the season when those powers are torpid. Buds consist of scales closely enveloping each other, and enfolding the embryo plant or branch. They resist cold only until they begin to grow ; and hence it is, according to the nature and earliness or lateness of their buds, that plants differ in their powers of bearing a severe or variable climate. By buds, says Smith, as we well know, plants are propagated ; and in that sense each bud is a separate being, or a young plant in itself; but such propagation is only the extension of an individual, and not a reproduction of a species, as by a seed. Accordingly, all plants increased by buds, cuttings, layers, or roots, retain precisely the peculiar qualities of the individual to which they owe their origin. If those qualities differ from what are common to the species, sufficient to constitute what is called a variety (as, for instance, the seckle pear, or black tartarian cherry, as distinguished from other pears or cherries), that variety will be perpetuated through all the progeny thus obtained. This fact, says the same writer, is exemplified in a thousand instances, and none more notorious than the different kinds of apples—all which, says he, are varieties of the common crab, *Pyrus Malus ;* and he fully assents to the opinion of Mr. Knight, that each individual thus propagated, by buds, cuttings, layers, or roots, has only a determinate existence—in some cases longer, in some shorter—and to this cause he attributes the fact that many valuable varieties of apples and pears, known in former times, are now worn out, while others are dwindling away before our eyes. We have a distinct recollection of two or three kinds of apples, and one of pears, on our grandmother's estate in Calvert county, Maryland, all aromatic and delicious fruits, which we feel confident have become extinct. *Propagation by seeds* is therefore recommended by botanists and horticulturists of the most extensive inquiry and enlarged observation, as the only true reproduction of plants, by which new and valuable varieties may be obtained, each species kept distinct, and all variations effaced ; for though, says the author we are quoting, new varieties may arise among a great variety of seedling plants,

it does not appear that such varieties owe their peculiarities to any that may have existed in the parent plants.

The object obtained by budding is an early and rapid multiplication of any particular kind of fruit; and though it is but too probable that many of our readers may not have provided themselves with nurseries of stocks to bud upon (as every one should do, considering that they may be raised as easily, though not quite so quickly, as corn or peas), still there are few but who may find about their grounds or orchards subjects on which they may at once bud choice apples, and pears, and peaches, and cherries, from choice kinds within their reach.

Johnson says that buds of almost every species succeed with most certainty if inserted in shoots of the same year's growth; but he says the small walnut buds succeed best which are taken from the base of the annual shoots, where these join the year-old wood of that from which the bud is taken. Buds, says he, are usually two years later in producing fruit than grafts. It is recommended, however, as a general rule, that buds be taken from the middle of the shoot, as those from its point are said to make wood too freely, and those from its base to be more unexcitable, and consequently less prompt to vegetate. So much quicker and more rapid is the process of budding than grafting, that, Mr. Downing says, a skillful budder, with a clever boy following him to tie the buds, is able to work from a thousand to twelve hundred nursery stocks in a day; and he adds, among other reasons for giving preference to budding over grafting all stone fruits especially, such as peaches, apricots, &c., that *they* require extra skill in grafting, whereas they are budded with great ease. According to the same high authority, the several fruit-trees come in season for budding in the following order:—Plums, cherries, apricots on plums, apricots, pears, apples, quinces, nectarines, and peaches. Before commencing, says Mr. Downing, you should provide yourself with a budding-knife, [Fig. 1,] about four and a half inches long, having a

Fig. 1.

rounded blade at one end—and an ivory handle, having a thin, rounded edge, called the *haft*, at the other. But let not any indolent reader excuse himself that there is no *exactly such knife* within his reach! True, every farmer of becoming pride will be provided with these small affairs, just as the true disciple of Izaak Walton will take care, before the season comes on, to have all his fishing tackle in apple-pie order: his bamboo, and, for lighter fishing, his white cane rod; his lines of silk, of hair, and of silk-worm gut, manufactured from the intestines of that wonderful insect—being, for its circumference, the strongest substance known to the angler. He will have his tip-capped float, and his cork float, and his plugged float; he will have his winch, his basket, his landing net, his naked hooks, and his flies—his May fly and his ant fly, his dun-red hackle and his candle fly. Say, ye spirits of old uncle Izaak, and of Cotton, and—no less known in his day and his sphere—of our old fellow angler, Col. Jack Thomas! what will he not have that a genuine angler should, that all may be O. K.? Yet we have seen a good mess of fish as ever was made into "Black Dan" chowder, taken at old Rock Hall, with a plain cedar angle and common twisted-cotton line. Why then should not the farmer of the true grit take care to have all *his* tackle, too,

in perfect order at a moment's warning?—his knife of peculiar make, as laid down by authority, for budding; and soft matting for wrapping; and suitable wax for binding up and healing the wounds of trees budded and grafted, or such as, having their limbs torn off by the wind, require the care of the surgeon?—Why should he not have always in perfect order his knives adapted also for butchering, and his fleams for bleeding, and his shears for shearing his flocks—just as a dentist or a surgeon has all his tools and instruments in perfect trim? Are farmers to be, in truth and for ever, what the world is prone enough to consider them—a poor, spiritless race of drudges, without any of that pride of profession, and *esprit du corps*, which animates the followers of other pursuits—the racer, the sportsman, the shipmaster, and the military man—to excel in their knowledge, and preparations, and appointments, and in their readiness to challenge public scrutiny and comparison, each in the *line of his calling?* But feelings of indignation are overcoming and running away with us, as usual, whenever we think of an *American farmer*, standing on *his own* freehold estate—the monarch of all he surveys—being content to drudge, and live on, from hand to mouth, without any of that forecast, neatness, or ambition of excellence and honorable distinction, without which he can hardly expect to reach, much less rise above, vulgar mediocrity, and the want of which always marks him a victim and a hobby, to be fleeced and ridden by misers and demagogues!

Fig. 2.

Fig. 3.

Fig. 4.

The manner of performing the operation of budding is thus described by the voluminous author whose life and writings were briefly memorialized in our June number. The method he recommends, and that which is in general use, and which long experience has proved to be best, is called "*T budding*," [fig. 2]—so called from the form of two cuts that are made in the bark of the stock to be budded—or "*shield budding*," as it is sometimes called, from the form of the piece of bark on which the bud is seated, [fig. 3,] being in the shape of a shield when it is prepared to be inserted within the T cut in the bark of the stock.—"*Scallop budding*" is also described by Loudon, and M. Thouin describes twenty-three modes, which we mention only to show the reader how much thought and ingenuity have been bestowed on an apparently small matter about which it may happen that he, a free born American republican landholder, in the pride of his position and circumstances, has never spent a thought. For every useful purpose it is deemed, however, sufficient to give the following directions for *shield budding*.

With the budding knife make a horizontal cut across the rind, quite through to the firm wood; from the middle of this cross or transverse cut make a slit perpendicularly downward, an inch or more long, going in this case also quite through the bark into the wood. This is done as shown in fig. 2. Proceed with all expedition to take off a bud, holding the cutting or scion, fig. 4, in one hand, with the thickest, or that which was the lower end, outward, and with the knife in the other hand, enter it about half an inch or more below a bud,

cutting nearly half way into the wood of the shoot, and then continuing it with one clean, slanting cut, about half an inch or more above the bud, so deep as to take off part of the wood along with it, the whole about an inch and a half long, as in fig. 3; afterward cutting off at *a* the leaf under which the bud is situated, leaving its foot-stalk attached to the bud, that by it you may hold it between your lips while with your budding-knife the lines are cut in the stock, where the bud is to be inserted, which should be at a place where the bark is smooth and free from any bruises or knots, and on the side rather from the sun. Then directly with the thumb and finger, or point of the knife, slip off (according to the English and European fashion,) the woody part remaining in the bud, which done, observe whether the germ or eye of the bud remains perfect; if not, and a little hole appears in that part, it is imperfect, or, as the gardeners express it, the bud has lost its root, and another must be prepared. Next, slip down the bud close between the wood and bark of the stock tree, to the bottom of the slit. The next operation is to cut off the top part of the shield or bark of the bud even with the horizontal first-made cut in the bark of the stock, so as to let it completely into its new residence, and to join the upper edge of the shield, with the cross or transverse cut, in the stock, that the descending sap of the stock may immediately enter the bark of the shield, and protrude granulated matter between it and the wood, so as to effect a living union between the bud and stock. The parts are now to be immediately bound round with a ligament of fresh bass, previously soaked in water, to render it pliable and tough, or, as Mr. Downing says, with soft matting, to be tied firmly over the whole wound, commencing at the bottom, and leaving the bud and the foot-stalk of the leaf only, exposed to the light and air, as in fig. 5, not too tight, but just sufficient to keep the whole close, and exclude the sun, air and wet.

Fig. 5.

It will be seen by the above that according to the English and European method of performing common shield budding, you are cautioned to be careful to take out from the bark on which is the bud the small piece of wood on which the bark is, and which has served you up to this time to keep the bud and bark from drying and shrinking; but this "nice matter," as it is called, it is important to bear in mind, is altogether dispensed with in the American mode of shield budding; and the "American mode of shield budding," says Mr. Downing, (whose works we ought to presume form a part of every gentleman farmer's library,) "is found greatly preferable to the European mode, at least for this climate. Many sorts of fruit trees, especially plums and cherries, nearly mature their growth, and require to be budded, in the hottest part of our summer. In the old method," says Mr. D. "the bud having only a shield of bark, with but a particle of wood in the heart of the bud, is much more liable to be destroyed by heat than when the slice of wood is left behind in the American way. Taking out this wood is always an operation requiring some dexterity and practice, as few buds grow when their eye or heart-wood is damaged. The American method, therefore, requires less skill, can be done earlier in the season, with younger wood, is performed in much less time, and is uniformly more successful. It has been very fairly tested upon hundreds of thousands of fruit trees in our gardens for the last twenty years, and, although practiced English budders coming here, at first are prejudiced against it, as being in direct opposition to one of the most essential features in the old mode, yet a fair trial has never failed to convince them of the superiority of the new one."

Having thus gone through with a process so light, and so interesting in its nature and results, that every schoolmaster might and ought to teach it, were it only for amusement at play-time, in the country schools, and even to the girls who are to make housewives, as well as to boys who are to be their husbandmen; we have only to copy what we find in the books, and what is the result of ample experience as to the *future treatment*.

In about two weeks after the operation it will be seen, by the roundness and healthy look of the bud, whether it has taken; and we are assured that not more than six or eight per cent. of them ought to fail. In about a fortnight after, let the bandage be loosened, so as to allow the whole plant to swell, and in about five weeks from the time of budding, it may be removed altogether; but sometimes, when the budding has been performed very late, the bandage is left on through the winter.

Just when the sap begins to move in the spring you "head down" the stock at about half an inch above the bud, by beginning behind it, and making a sloping cut upward. A piece of the stock is sometimes left, about six inches long, to which to tie the first summer's shoot, to prevent it from being broken by the wind; a precaution not amiss when the shoot from the bud is exposed to high winds; but even then it is suggested to be better, if you see any danger, to tie a short stick on the top part of the stock, and to this tie the young shoot, when the sap will all go into the shoot through and from the bud, instead of being divided between it, and six inches of the stock sometimes left as above stated. Mr. Downing bears testimony to the great advantage, when budded trees do not take readily, in having recourse to Mr. Knight's excellent mode of budding thus described in the Horticultural Transactions, and in which he employed two distinct ligatures to bind the buds in their places: "One ligature was first placed above the bud inserted, and upon the transverse section through the bark; the other, which had no farther office than securing the bud, was applied in the usual way. As soon as the buds had attached themselves, the ligatures last applied below were taken off, but the others were suffered to remain. The passage of the sap upward was in consequence much obstructed, and the inserted bud began to vegetate strongly in July; and when these had afforded shoots about four inches long, the remaining ligatures were taken off to admit the excess of sap to pass on. Thus, the upward sap being arrested, the union of the upper portion of the bud (which in plums frequently dies, while the lower part is united,) is completed, and success secured."

If farmers were not, of all classes, the most careless, if not improvident, they would take care not only to learn themselves, but to have their children (daughters no less than sons) taught the common practice of grafting and budding, if not the principles of vegetable physiology involved in these processes; as also how to propagate by CUTTINGS AND LAYERS, both of which are described by John I. Thomas, in his valuable little work, the "FRUIT CULTURIST." By CUTTINGS, he says, consists merely in cutting off a branch or shoot from the tree, and inserting it into the soil, leaving the upper end above the surface. The moisture of the soil supplies the sap.

As to LAYERS, Mr. Thomas says: "Many plants which cannot be increased by cuttings, and, indeed, with great difficulty by budding and grafting, may be readily propagated by *layers*. This consists in bending down the branches to the ground, and covering the middle portion with soil. The portion takes root, and then the branch is separated."

How easy it would be for every farmer to beguile his time in the performance of these operations, to study the nature of them in books, and thus, at the same time that he supplied his family with various and choice fruit, save the time, and the money, and the character, that are now lost in idleness in taverns and groggeries.

THE EFFECT OF FREE TRADE ON THE BRITISH FARMER.

It is universally agreed that the admission of foreign grain into England, with a view to the protection of the manufacturers against the high price of food, which is, in fact, the raw material of every industry, has reduced the English cultivator to great straits. It is in fact with him, from all we can see, a question of life or death. The friends of the free admission of foreign grain contend, that the admitted difficulties and distress of farmers, may be overcome by what is there called emphatically *high farming*—that is, by the application of the highest degree of science in the practice of agriculture, and by the liberal application of capital in draining and manuring. The farmers generally answer to this allegation in a tone of denial and despair. It would really appear that ruin stalks them in the face. The effect will be to drive thousands to this country, who would otherwise remain at home, and any policy of our government, that would raise the price of labour, in other industries, would at once tempt the immigrant to our shores, and when he came, so increase his power of consumption over that which he possesses abroad, even if there he was, in fact, a consumer of American produce, that such policy could not fail to benefit American agriculture. A writer in a late English paper, on the possibility of meeting their difficulties by any practicable system of high farming, makes the following suggestions, which we give for the sake of making the inquiring farmer in America familiar with the burdens to which agriculture is subject in England. As an item of information in the line of his business, is it not worth the small space it occupies? To read it understandingly, let him turn English into American currency, near enough for all practical use, by multiplying the pounds by 5 to bring them to dollars, and the shillings he may regard as quarters of dollars —or 24 cents for more exactness, the penny for 2 cents.

Finally, is it not wonderful that a greater number of these English and Scotch farmers do not come here, and buy the fee-simple of land for what the land pays there, not for *rent*, but for *tithe and poor rates?*

In East Lothian, in Scotland, farmers often pay $35 an acre *rent* per annum. That is near the town, but generally from $10 to $20, but the tenant goes on the land with a *capital* equal to $50 an acre; and then he practices with a skill and industry and energy which these requirements and means demand and imply, enabling him to turn his capital and skill to account. Yet what would not the same skill and *capital employed* do here—that is, if other industries were so encouraged, that the farmer would have a remunerating demand on the spot for meat and mutton, such as exists in England?

What madness in a nation like this to forego the full development and highest and best manufacture and use of the bountiful materials which God has given us for the consummation of every industry!

That much remains to be done to the land in some districts in draining and other permanent improvements, as also by a more skilful system of farming, is obvious to every person acquainted with the mere rudiments of agricultural knowledge; but it must be admitted by the advocates of scientific advancement that the great breadth of land in England and Scotland, in regard to cultivation, is worthy of comparison with any like extent of land in the world. Where is the average produce per acre so great as here. The farmers have for the last 30 years been in a state of healthy progression, and although they may not now run in the race of science with the eagerness some of their friends may desire, they are not unmindful of the importance, indeed of the absolute necessity, of adopting the various improvements in cultivation suggested by the superior intelligence of the age. All, however, cannot be luminaries; but the more unlettered of practical farmers will surely follow every course of improved culture fairly tested and sanctioned by the better informed of their neighbours. But can low prices be met by high farming? I am a practical farmer, and although, fortunately, I am not de-

pendent on the prosperity of agriculture, my earliest associations and present sympathies are deeply rooted in the cause. My experience has been upon a clay farm of 100 acres, 65 acres of which are arable and the other 35 acres are grass. I have done much to improve the land, and have not grudged any outlay of a reproductive character. The following is the result of my last year's cultivation:

Wheat from the harvest of 1848, 5*s.* 8*d.* per bushel		£204 3 0
Profit by horse-keep, exclusive of farm horses		28 10 0
Sheep sold		37 1 6
Pigs do.		32 6 0
Poultry		5 6 0
Beans (not consumed on the farm)		13 0 0
		£320 6 6
One year's rent	£100 0 0	
Tithe and rates	31 0 0	
Labour, exclusive of work done by farm horses	142 3 0	
Guano and other manures bought	26 0 0	
Tradesmen's Bills	22 10 0	
	£321 13 0	
Loss, besides interest of capital	1 6 6	
	£320 6 6	

Such is my experience of last year. Had, however, the old average of prices been maintained, I should have had a moderate profit, but no more.

Total realized as above	£320 6 6
Depreciated value of produce, one quarter	106 15 6
	£427 2 0
Expenditure as above	321 13 0
Assumed balance for interest of capital and profit	£105 9 0

Wheat is the great crop on clay land, and I had 30 bushels to the acre last year. This I consider a fair yield on the average of clay land. If I am wrong in the view I take, I should be glad for any of your readers to correct the opinion, and kindly to supply a balance sheet, in order that one may judge of the quantity produced, and count the cost of production. I need not refer to the price of produce with which the present season has opened. The fact is too well known. I regret to learn that the farmers in some districts have reduced the wages of the labourer to 6*s.* a week. In my own neighbourhood, the able-bodied man is at present receiving 9*s.*; but this rate cannot, I fear, be maintained through the winter. The competition for farms, arising from the increase of population, and the death struggle of many for a bare subsistence, will keep up rents for a time.

TURNIPS—THEIR KINDS AND CULTURE.

We have never yet been persuaded, that the turnip may not be cultivated afield, profitably, to a much greater extent than it is in the United States; for it may probably be affirmed, that there are not six States in the Union, where they are grown expressly as *food for stock*. Now, as it is well known, that in the country, next perhaps after Belgium, most worthy of being studied and followed in her steps that relate to agricultural improvement; they look to this vegetable as the foundation of their hopes of improvement—nay, may even be said of their wealth and power; it assuredly behooves us, to consider and to find out, whether and why it is, that turnips may not, in like manner, be looked to as one of the means of recruiting our exhausted lands, and if they cannot—what is the *best substitute for them?* Have we any substitute at present? Some will say Indian corn. But how can that be so, seeing that corn is never given to cattle, except for *fattening?* The *grain* of corn is rarely looked to as the means of augmenting the fertilizers of a farm,

as turnips are universally in England. Who has ascertained and who uses and relies upon the value of corn for that purpose? Do we or do we not want, some bulky vegetable to combine with the hay and straw? both for the health of the animal and the increase of the manure? And what vegetable or root is best in our climate and circumstances? Is it cabbage, or carrot, or turnip? Well we know, that in their nature and composition turnips seem to demand a degree of moisture which is characteristic of the English, and *not* of *our* climate, generally—yet how is it, that under the effect of premiums offered for heaviest crops on parts of acres, we have so many accounts of yields at the rate of 700 bushels and more? If we are not mistaken in our recollection, Col. Powell repeatedly raised upwards of 1000 bushels of ruta baga to the acre, near Philadelphia, while at Marshfield, and elsewhere, particularly at Mr. Corning's farm, near Albany, under the management of Mr. Sotham, we have repeatedly seen crops of turnips that would be accounted good, even in Norfolk, England. The specimens exhibited at the last cattle show, from Otwell, near Easton, Md., were twelve inches in diameter, and the summer, we believe, was accounted a dry one. We have often thought that through all our mountain regions, where moisture in the form of fogs and dews, insure constant supplies of grass, turnips might be made subservient to their grazing systems, and to maintaining their lands in their pristine fertility. It is not even in England, however, where a thousand bushels to the acre is a common crop, that this root is expected to pay, *per se*—but it is considered indispensable to that heavy supply of barn-yard manure, which causes it to be accounted "*meat and meal*" for the English farmer. The turnip fattens the bullock, and the sheep, and the offal of the bullock and the sheep fattens the land to the tune of 30 to 40 and 50 bushels of wheat and 60 of barley to the acre, as a common yield.

For ourselves, we apprehend that the frequent failures by which American farmers are deterred from raising this root arise from *light manuring, late sowing,* and leaving the crop *too thick on the ground.* It is a crop too that wont bear the distant transportation, which must ensue when the producer, as with us, in most cases, is far away from the consumer; because much of its bulk and weight, in proportion to its nutritive properties, is of no value—being *water*—and therefore, to be raised economically, must be fed where they are made.

Of purple and yellow turnips, grown on various soils, and examined in the laboratory of Professor Johnston, the lowest proportion of *water* was 87.45 parts in 100.

He gives a statement of 61 tons, without leaves, to the acre in 1814, on the farm of the Duke of Portland; and of a crop of 55 tons in the same parish, by Mr. Stonearth. The first of these crops, he says, was equal to 6 tons, the latter to 5½ of dry nutritive matter per imperial acre. In England, they classify their turnips into Swedish or *ruta baga, yellow* turnips and *white*—and of these again there are, of the Swedish turnips, nine sorts, of the yellow, sixteen; and of the white fourteen, under as many different names. The celebrated William Cobbett was the first to teach us the superiority and the management of the Swedish turnip or *ruta baga.* The potato, he said, was made up of "dirt, water, and straw." Baxter, who deserves to be regarded as high authority says (meaning, of course, when they are cultivated as they are universally in England for food for stock), that one kind from each of the three classes seems almost requisite to be cultivated on every farm; although the yellow is omitted in some districts, and the Swedes in others. Where the Swedes are omitted they have never been cultivated, and where the yellow is the favorite, the Swedes are unknown, for where they are known, their culture is *never relinquished,* and they are treading hard upon

the yellow, and even curtailing the boundary of the white. The white varieties come earliest into use, and will always be esteemed on account of their rapid growth and early maturity, though unable to withstand the severest effects of frost. It is they which first support the cattle and sheep; being ready for use as soon as the pasture fails. The yellows then follow, and last for about two months, that is to the end of February or thereabouts; then the Swedes finish the course, and should last till the grass is able to support the cattle. Of all the varieties of white turnip the white globe (*brassica rapa, depressa alba*) is generally considered the best for early maturity, sweetness, juiciness, size of root, weight of crop, and elegance of form. Though the root does not feel particularly heavy in the hand, continues Baxter, it does not emit a hollow sound when struck. Its specific gravity is 0.84, and its nutritive properties 42 parts in 1000; of which are, of mucilage 7; of sugar 34, and of albumen or gluten 1.

The weights of prize samples vary from 8 to 15½ pounds each root, and the crops from 20 *to* 35 *tons per acre!* The nutritive property of the yellow, says Baxter, is 44 in 1000 parts, and of the Swedish turnip 64 in 1000, of which 9 are starch, 51 sugar, 2 gluten, and 2 extract. Picked specimens have varied in weight from 7 to 9½, but 8 to 10½ is not uncommon. A crop of 16 to 20 tons may be obtained by very ordinary culture, and in the neighbourhood of large towns (meaning where manure may be more freely used), he says, 28 to 35 tons may be obtained.

It is not, reader, that we are at any loss for a subject, that we have turned to one so commonplace and homely as this; on the contrary, our files of matter, well worthy of being read, are swelling to repletion, and seem, like hoven cattle, to cry aloud for relief; but if circumstances permit and cause you to make trial of turnips as food, even for a few sheep or cattle, now is the time to make your preparation; and therefore, while it may not yet be too late, we deem it expedient, and hope it may prove acceptable, to give the following account of the result of an inspection made, by members of a Farmers' Club in England, over a number of fields in the district—not for the purpose of any competition among farmers, but (for what we should like to see practiced in our own country), to give general information as to *the real ordinary produce in the district*, and also, by comparing the weights produced in different fields, under ordinary management, but varying circumstances, that useful and practical suggestions might be elicited. The inspection was made over thirty-four farms, occupied by members and others; all except five, being tenant farmers. The mode adopted was by taking ten lineal yards in different fields, selected as affording a fair average. The results were thrown into tabular form, of which we have taken the first sixteen instances as sufficient for our purpose, which is to give the American reader for once, a fair view of that, of which all have heard so much, *the turnip culture of England*—which, as we before said, lies at the bottom, and forms the basis of her national subsistence and power. Take the turnip from English husbandry, and you withdraw the keystone in the arch of her strength as a nation. But before giving as much of the *table* as will answer the purpose of the reader just as well as if we gave the whole of it, it may make this article more satisfactory, to give also some general observations which were agreed on by the club, as conclusions to be drawn from all the facts that came in view.

Among other points on which they came to an agreement, one was—that *early sowing* had been invariably advantageous. In the case of Swedes and yellow turnips, those sown before the middle of May were *several tons* more productive to the acre than those sown about the first of June. But be it remembered, that they begin to prepare their land immediately after harvest. The general impression there is, that on land of ordinary fertility, the space between

the drills should be from 28 to 30 inches. As to the space between each root in the hill, that depends on the quantity of manure and the fertility of the land. The impression of the club was, that although the general practice was to leave them 7 or 8 inches in hoeing out the crop, that was much under the proper width, "especially with *full-mixed* manure"—meaning compost, bones, guano, &c. They say—"It appears to be a very general practice to apply, in addition to 16 or 18 yards (cubic), of dung per Scots acre, about two or two and a-half cwt. of guano or 15 bushels of bones." Here, however, is what will stagger the American farmer, who, in too many cases, pays so little attention to the quantity or quality of manure. The club say, "but while these manures do not exceed the present prices, viz., 2*s.* 3*d.* per bushel for bones (54 cents), and £9 to £10 ($45 to $50) per ton for Peruvian guano, and if the best beef and mutton reach about 6*d.* (12 cents) per lb., there seems no question, but a large quantity of extra manure should generally be applied; the club adhering to an opinion expressed in a former discussion, that the value of 40*s.* ($10) per Scots acre of purchased manure be applied in addition where the farm-yard manure gives 15 yards over the whole green crop on the farm. The first and most material point evidently to be attained, however, is an addition to the quality and quantity of farm-yard manure.

The Scotch acre is equal to one acre, one rood, two perches (nearly) of English measure.

We have referred to the probably better adaptation of our mountain regions to the growth of turnips, and here we find it stated in the amount before us, that with the exception of one or two farms, the whole are from 150 to 400 feet above the sea level, but the farm of Kirkhill, on which the crops were above an average, was more than 500 feet above.

We have, since writing the above, seen it stated in the American Farmer by Patuxent Planter (one of the few agriculturists who exercises the faculty of *clear thinking*, about everything connected with his vocation), he says:—

"Again, if our modern farmers would only raise large crops of roots, and manure the land for them as our forefathers used to manure the 'turnip patches,' we should soon have our whole land like a rich garden spot."

Surely there need be nothing more pointed than this in favour of raising roots as food for stock, and the question is again as to the kind.

In England, the experience of one writer some years ago, with a considerable flock of sheep, folded over thirty acres of common and Sweedish turnips, led to the inference that one pound of meat is made during the consumption of every 150 pounds of green food; and in the Maine Farmer, we find the following comparative estimate of different kinds of food.

"Hay is the food for cattle during winter. If they can get good hay enough, during the cold season, they do very well. It is not always that the farmer has sufficiency of this for his stock, and hence it is useful to know the comparative value of other articles which may be used as substitutes for it. It is also more agreeable, and we think more profitable, to mingle other articles with hay. We have prepared from various sources the following table:—

"Taking good hay as the standard, 100 lbs. of hay equal 276 lbs. carrots; 300 lbs. ruta baga; 317 lbs. mangold wurtzel; 201 lbs. potatoes; 494 lbs. common turnips.

"By calculating 60 lbs. for a bushel of any of the above roots, it will be seen that one ton of hay equals 91 bushels of carrots; 100 bushels of ruta baga; 106 bushels mangold wurtzel; 67 bushels potatoes; 165 bushels turnips.

"From this it will be seen how much fodder you get of each, per acre, compared with good hay.

"In regard to straw, experiments have established the following estimate as very near the truth; 100 lbs. of hay equal to 272 lbs. new wheat straw; 166 lbs. barley straw; 169 lbs. pea straw; 94 lbs. clover hay."—*Maine Farmer.*

Having alluded to the uniformly heavy crops of turnips obtained at Marsh-

field, however, it may be proper to note the conformity of management there to the English system of high manuring and thorough preparation in other respects—for the whole farm lies open to the sea, rising gradually from the "*marsh*" from which it takes its name.

TABLE OF FIELDS OF TURNIPS,

Inspected between 20th and 22d of November, 1849.

KIND OF TURNIPS.	Drills apart Inches.	No. of Turnips in 10 yards.	WEIGHT. Per Scotch Acre. Tns. Cwt.	WEIGHT. Per Imp. Acre. Tns. Cwt.	MANURE PER SCOTCH ACRE. Farm yard dung. Cubic yard.	Guano. Cwt.	Dissolved Bones. Cwt	Ground Bones. Bushels.	When Sown.
Hardgrave, Dalton Parish—									
Swedes . . .	28	28	35 12	28 9	15	4	0	17	May 23 & 25.
Purple Top Yellow	28	28	31 8	25 2	15	2½	0	13	June 1 to 6.
White Globe .	28	26	33 3	26 10	12	2	0	10	June 8 to 24.
Hardy Green .	28	29	31 14	25 7	15	2½	0	13	June 12.
Smallholm, Lochmaben—									
Swedes . . .	26	42	26 13	21 6	15	1	1	0	
Yellow Bullock	26	43	27 9	21 19	15	1	1	0	
Preston House, Lochmaben—									
Swedes . . .	28	45	29 13	23 14	28	1	1	0	
Yellow . . .	28	41	26 10	21 4	28	1	1	0	
Greenhillhead, Lochmaben—									
Swedes . . .	26	44	24 6	19 9	26	3	0	0	
Yellow Bullock	25	35	37 0	21 12	25	2	0	6	
White Globe .	25	32	31 0	24 16	25	2	0	6	
Dalfibble, Kirkmichael—									
Swedes . . .	27	44	30 0	24 0	20	2½	0	0	
Ditto	27	44	27 17	22 5	20	0	0	15	
Yellow Bullock	27	44	22 16	18 5	20	2½	0	0	
White Globe .	27	43	32 11	26 0	20	2½	0	0	
Ditto	27	46	32 4	25 15	0	2½	0	15	
Hillside, Dryfesdale—									
Swedes . . .	28	33	26 10	21 2	25	2	2	0	May 15 to 20.
Yellow Bullock	25	57	22 16	18 3	20	2	0	16	June 12.
Common Red .	28	44	27 0	21 9	20	0	2	0	June 20.
Yellow bullock	26	48	30 16	24 10	20	2	0	0	May 25.
Dryfeholm, Dryfesdale—									
Swedes . . .	28	40	29 6	23 7	24	2½	0	0	May 12.
Ditto	29	37	22 18	18 5	24	2½	0	0	June 1.
Beckton, Dryfesdale—									
Swedes . . .	27	43	31 16	25 6	20	2½	0	0	
Yellow Bullock	28	52	32 12	25 19	20	2½	0	0	
Kirkburn, Dryfesdale—									
Swedes . . .	29	42	34 16	27 14	30	2	0	0	May 12.
Ditto	29	40	29 0	23 4	30	0	0	0	May 6.
Yellow Bullock	27½	34	26 12	21 4	20	2	0	0	May 28.
Lockerby Townhead, Dryfesdale—									
Swedes, alternate . . .	26	41	24 10	19 12	35	0	0	0	June 6.
Yellow Bullock	26	41	32 0	25 9	35	0	0	0	June 6.
Broomhouses, Dryfesdale—									
Yellow . . .	29	36	26 16	21 7	26	0	0	0	
Swedes . . .	30	44	32 6	25 14	26	2	0	0	
Millbank, Applegarth—									
Swedes . . .	29	56	31 9	25 1	20	2½	0	0	May 30.
Yellow Bullock	29	42	29 11	23 11	20	2½	0	0	June 2.
Ditto, undrained	30	50	17 3	13 13	0	2½	0	16	June 9.
Muirhousefoot, Applegarth—									
Swedes . . .	30	34	21 10	17 2	20	2½	0	0	
Yellow . . .	27	62	26 18	21 9	18	0	0	0	

KIND OF TURNIPS.	Drills apart Inches.	No. of Turnips in 10 yards.	WEIGHT. Per Scotch acre. Tns. Cwt.	WEIGHT. Per Imp. acre. Tns. Cwt.	MANURE PER SCOTCH ACRE. Farm yard dung. Cubic yard.	Guano. Cwt.	Dissolved Bones. Cwt.	Ground Bones. Bushels.	When Sown.
Muirhousehead, Applegarth—									
Swedes . . .	27	36	26 18	21 9					
Balgray, Applegarth—									
Swedes . . .	29	45	28 6	22 11	35	0	0	0	
Yellow Bullock	29	43	36 14	29 3	35	0	0	0	
Lang's Green Top Swede .	29	48	33 0	26 5	35	0	0	0	
Bellcathill, Applegarth—									
Swedes . . .	29	50	26 6	20 19	30	0	0	0	
Yellow Bullock	29	42	23 12	18 16	30	0	0	0	
Ditto	29	66	23 5	10 10	0	4	0	0	

The original table contained eighteen fields more, but we have given enough to show the run of the fields and the system. At the end of the whole the English editor says, the leaves and roots were excluded, and that the average weight of all the fields

	PER SCOTS ACRE. Tons.	Cwt.	IMP. ACRE. Tons.	Cwt.
Was for Swedes	27	9	21	16
" Yellow	25	6	20	2
" Common	28	2	22	7

After all, the expediency or profit of root culture and the extent to which it should be carried, must depend on the price of the root itself in an available market, or on that of the thing to the production of which, whether milk, meal, or meat, it is intended to contribute. A writer in a late number of an English agricultural paper puts down the cost of an acre of roots there, as follows :—

"I charge rather less for hoeing, as I make use of Garret's horse-hoe, which costs something less than 9*d.* an acre, and I put interest on capital at 5*s.* 6*d.* an acre more than your correspondent.

ESTIMATE.

	£.	s.	d.
Rent, tithe, and taxes	2	0	0
Interest on capital, 15*l.* per acre . . .	0	15	0
Ploughing and subsoiling in autumn . . .	1	5	0
Cultivator in spring	0	2	6
Double harrowing and rolling	0	4	0
20 tons manure and filling	4	0	0
Ridging	0	2	0
Women spreading dung in furrows . . .	0	1	3
Splitting the ridges over the manure . . .	0	2	0
Drilling and seed	0	4	6
Singling	0	3	6
Twice horse-hoeing (Garrett's) . . .	0	1	8
Hand-hoeing in the rows	0	3	6
Pulling, topping, and storing in clamps . .	0	7	0
Four bushels superphosphate of lime drilled with the seed	0	16	0
	£10	8	3

"I am inclined to think horse and man labour somewhat under-estimated, in respect of the application of the manures, and that a safer estimate would be 10*l.* 10*s.*—*C. L.*"

Of Garrett's patent horse-hoe, here referred to, the reader may expect a drawing and farther notice in our next.

PRACTICAL ADVANTAGES OF CHEMISTRY TO PRACTICAL FARMERS—QUESTIONED.

Winchester, December 21st, 1849.

DEAR SIR—Inclosed you will find five dollars, which place to my credit. I trust you will not attribute my tardiness in remitting to lukewarmness or indifference in the success of your valuable paper, far from it. The contrary is the fact. I hope you may be abundantly supplied with the "needful" and every other requisite, so as to be able to communicate a little more "common sense" to a certain portion of our community, who are burdened in so unusual a degree with "uncommon sense"—let them have it. *The true policy will prevail at last.*

A great deal has been said and written of late, on the importance of a knowledge of agricultural chemistry to the farmer, to enable him to cultivate his lands in the most profitable manner to himself and fellow-men.

Now, my dear sir, will you be so good as to tell me what practical good chemistry is to a farmer (as a farmer), and what discovery has chemistry ever made that would enable him to raise one blade of grass more? I am particularly anxious that you will publish the answer to these questions in the "Plough, the Loom, and the Anvil," first, because you would take a more impartial view of the subject, than any one I know—and secondly, because there is considerable diversity of opinion and much interest manifested by the farmers in this section of country. I trust you will not consider it presumptuous or arrogant in me to array myself on the negative side of this question, and in opposition to such men as Von Thaer, Liebig, and a host of others. With all due deference to their learning, I think they start on false principles. For instance, they set down as an axiom that plants derive all their elements from *without,* and cannot produce an element in any other way—that is, all the carbon, oxygen, hydrogen, nitrogen, sulphur, phosphorus, potash, soda, silica, lime, &c., are drawn from the earth, air and water, just in the same state it is found in the plant when analyzed—if that is true, it would necessarily follow, that for a farmer to *keep up* the fertility of his farm, he must always return to it exactly as much as he takes off—and to *improve* it, he must return more. Now, sir, do you know a single farmer in your extensive acquaintance, who returns to his farm anything like as much as he takes off? Yet many farmers not only keep up the fertility of their farms, but improve them considerably—how is it done? not by manuring certainly (I allude to large estates), for if he had manure sufficient to top-dress 3 or 400 acres of wheat he could not apply it—but by suffering his clover to fall on his fields the first year, and the second to be grazed or taken off, as close as possible, when it will produce a better crop of wheat than the preceding. It cannot be said in this case that anything was added to the soil, because, according to the above axiom, the field was exhausted to the amount of the first crop of wheat, and the first crop of clover that was allowed to rot derived all its elements from the soil, &c., which again was absorbed by the second crop taken off—therefore, the field would be left in exactly the same state it was in after the first crop of wheat—but this is not the fact, for we know the contrary to be true. To what, then, it may be asked, is attributed the improvement? Dr. R. J. Baldwin would say to the *shade* of the clover and to the *shade only,* and in my opinion he would say rightly.

It seems to me, that instead of plants deriving their elements without change from the earth, &c., they have the power of *creating* them by their vital process, and that the vegetative principle in the soil is an imponderable substance, but what it is, and how a living plant is produced out of it, is a question

which learned men have been attempting to solve, from time immemorial—and are no nearer the solution now than at the beginning.

I saw somewhere an account of an experiment which is in point—200 pounds of thoroughly dried earth was put into an earthen vessel—the earth was then moistened with water, and a willow tree, weighing 5 pounds, was planted therein—after 6 years the tree was removed and found to weigh 169 pounds 3 ounces—the earth was then removed from the vessel, again dried and weighed—it was discovered to have lost only two ounces of its original weight—thus 164 pounds of woody fibre, bark, roots, &c., were produced. Now, if the results of this experiment be correctly given, what becomes of the theory of Thaer and others, viz: that plants derive all their elements, without change, from the earth, &c.

If you think proper to publish this communication, I beg that you will omit my name; I have no desire to see it in print.

With great regard, I am yours,

JOHN S. SKINNER, ESQ. I. F. H.

We have no idea that "grown up" farmers are generally to be benefited by lectures on Agricultural Chemistry. But if taught at school, it would be to the man all his life an interesting and valuable accomplishment. That chemistry may throw light, however, on the constituent elements of soils, food, plants, and manures, who can doubt? Dr. Higgins, the State chemist of Maryland, has, by analysis, detected deficiencies and impurities in various artificial manures, and given most salutary advice on the subject to the legislature and the farmers of that State. We lately saw the following in the Edinburgh Review :—

CHEMISTRY AND VEGETABLE FOOD.

It is the object of chemical research not merely to explain known facts, but to remove misapprehensions and correct erroneous opinions The recent determinations of the proportion of nitrogen contained in wheat have served both these purposes. Thus it was long asserted and believed, that the wheat of warm climates always contained more nitrogen, and was consequently more nutritive and of higher money value, than the wheat of our more temperate countries. But later researches have corrected this hasty deduction; and have placed our home wheat in its proper position, economical and nutritive, as compared with the wheat of India, of Southern Australia, or of the Black Sea.

Again, the British miller usually requires a portion of foreign wheat to mingle with our native grain, both to make it grind more easily, and to satisfy the baker with a flour which will stand much water. The pastry cook and the macaroni maker also demand of him a flour which will make a peculiarly adhesive dough. These several qualities were supposed to be inherent only in wheat which abounded, in an uncommon degree, in gluten, and which was produced under specially favourable conditions of soil and climate. Modern chemistry has the merit of gradually removing these misapprehensions, and of directing us to the true causes of all such differences.

So in regard to the superior amount of muscle-forming matter supposed to exist in wheat in comparison with other kinds of native grain, such as the oat. Experience had long taught the Scotch that oats, such as they grow in their climate, are a most nutritious food; but the habits of the more influential English, and the ridicule of a prejudiced lexicographer, were beginning to make them ashamed of their national diet. Chemistry has here stepped in, and by her analysis of both has proved not only that the oat is richer in muscle-forming matter than the grain of wheat, but that oatmeal is, in all respects, a better form of nourishment than the finest wheaten flour.

But, what is more, chemistry has brought us acquainted with the value of parts of the grain formerly considered almost as waste. The husk or bran of wheat, for example, though given at times to pigs, to millers' horses, and other cattle, was usually thought to possess but little nutritive virtue in itself. Analysis, however, has shown it to be actually richer in muscular matter than the white interior of the grain. Thus the cause of its answering so well as food for cattle is explained; and it is shown that its use in bread (whole-meal bread) must be no less nutritive than economical.

The true value of other kinds of food is also established by these inquiries. Cabbage is a crop which, up to the present time, has not been a general favourite in this country,

either in the stall or for the table, except during early spring and summer. In North Germany and Scandinavia, however, it appears to have been long esteemed; and various modes of storing it for winter use have been very generally practiced. But the cabbage is one of the plants which have been chemically examined, in consequence of the failure of the potato, with the view of introducing it into general use: And the result of the examination is both interesting and unexpected. When dried so as to bring it into a state in which it can be compared with our other kinds of food (wheat, oats, beans, &c.), it is found to be richer in muscular matter than any other crop we grow. Wheat contains only about 12 per cent., and beans 25 per cent.; but dried cabbage contains from 30 to 40 per cent. of the so-called protein compounds. According to our present views, therefore, it is pre-eminently nourishing. Hence, if it can but be made generally agreeable to the palate, and easy of digestion, it is likely to prove the best and easiest cultivated substitute for the potato. And no doubt the Irish kolcannon (cabbage and potatoes beat together) derives part of its reputation from the great muscle-sustaining power of the cabbage—a property in which the potato is most deficient.

Further, it is of interest—of national importance, we may say—that an acre of ordinary land will, according to the above result, produce a greater weight of this special kind of nourishment in the form of cabbage than in the form of any other crop. Thus, twenty tons of cabbage—and good land will produce, in good hands, forty tons of drum-head cabbage on an imperial acre—contain fifteen hundred pounds of muscular matter; while twenty-five bushels of beans contain only four hundred pounds; as many of wheat only two hundred, twelve tons of potatoes only five hundred and fifty, and even thirty tons of turnips only a thousand pounds. The preference which some farmers have long given to this crop, as food for their stock and their milk-cows, is accounted for by these facts; while, of course, they powerfully recommend its more general cultivation as food for man.

We may add, while speaking of cabbage, that it is known to be so exhausting to many soils, that wheat will scarcely grow after an abundant crop of it. It springs up, indeed, but yields little straw, and early runs to a puny ear containing little grain. But the same analysis, which shows the value of the cabbage crop, shows also what it takes from the soil, and explains, therefore, the kind of exhaustion produced by it, by what special applications this exhaustion is to be repaired, and how repaired at the least cost.

Again: In many parts of our island furze or gorse grows up an unheeded weed, and luxuriates in favourable spots without being applied to any useful purpose. In other districts, however, it is already an object of valuable though easy culture, and large breadths of it are grown for the feeding of stock, and yield profitable returns. Chemical researches show its nutritive property to be very great. Of muscle-building materials it contains, when dry, as much as thirty per cent., and is therefore in this respect superior to beans, and inferior only to the cabbage. Under these circumstances we can no longer doubt the conclusions at which some experimental feeders had previously arrived, nor the advantage which might be obtained from the more extensive cultivation of gorse on many poor and hitherto almost neglected soils.

The history of the tussac grass is familiar to most persons.* A native of the Falkland Islands, where it grows in large tufts or tussacs, from which it derives its name, it is described as fattening in an extraordinary manner the stock, and especially the horses, which graze upon it. Some of the seeds which have been lately imported into this country having vegetated, the grown-up plants have been analyzed; and it was found, "that the proportion of muscle-forming ingredients in the dried grass is as great as in the best samples of wheat, oats, or barley, and therefore that the grass is of a very nutritious character." Thus its alleged feeding qualities are confirmed; and we may look forward to seeing it, on further trial, domesticated in Great Britain.

The money value of the above investigations is obvious enough, and we do not dwell upon them. But the same branch of chemical inquiry deals with questions of a larger and higher kind.

PROFITS OF FARMING.

Sir—I have tried to make out some long accounts in your paper about farming, but before I gets to the end, I forgets the beginning, and I have heard others in our neighbourhood make the same complaint; for I must tell you we be very good farmers but not much of scholars. Now let me show you and my brother farmers, in a short way, how my account stands, and I thinks they will say that theirs is pretty much the same.

* Here is another thing which we should long since have imported. For several years, two or three at least, we have had flattering accounts of its great value.

My landlord eats my wheat, the labourers eats the sheep, the parson the barley, the tax-gatherer the pigs and poultry, and my horses eats the oats. Now I wants somebody to tell me what there is left to support my family, pay interest on capital, and tradesmen's bills with? An answer will oblige.

Yours obediently,

TENANT FARMER.

The average quantity of foreign grain and flour, imported in England in the fifteen years commencing in 1832, to 1st January, 1846, was 39,206,496 bushels, of 70 pounds to the bushel, equal to 4,900,812 quarters; and in two years ending in 1848, the two years of partial "free trade," the average amount per annum was 89,517,592 bushels, of 70 pounds to the bushel, or 11,189,699 English quarters. Thus the excess of import under free trade is 50,319,096 bushels of 70 pounds to the bushel, or about 60,000,000 of bushels our measure.

"Now," says Mr. Jones, who, we see, was one of the most conspicuous witnesses before the English "Agricultural Customs Committee," "it is a well ascertained fact that the cost of English labour (owing to our great amount of taxation), is 10 shillings, $2.50 per quarter, in all the grain crops produced in England. Therefore," says he, "we find in the first onset of 'free trade,' that we have a diminished demand for English labour, to the amount of £3,144,940, or about $15,724,700, which" he says, "would give a year's employment to 120,958 able-bodied English labourers, instead of which we have been compelled to pay £1,190,764, or $5,753,820 to maintain *them* in workhouses."

Mr. Jones goes on to say, in a letter to the members of both houses of Parliament,—"To prove how much the free trade policy you have adopted, has lessened the demand for the labour of the people, I refer you to that fair and only correct test, the *increased amount of the poor rates*, and you will find that the average of the three years,

1844, 1845, and 1846, was .	£4,990,000.
In 1847, ...	5,298,787.
In 1848 (free trade), . . .	6,180,764.

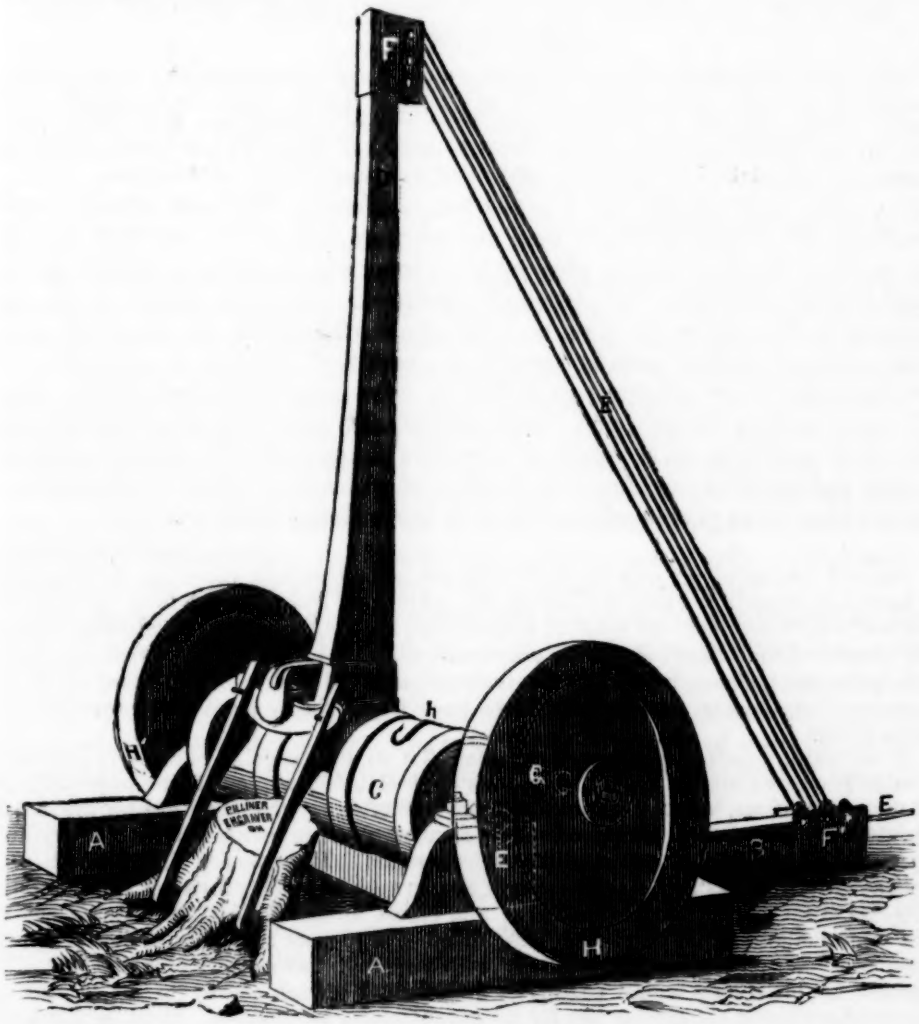
Here we have the wages of labour so reduced, and so many brought to beggary, that the taxes to support them, amount to $30,903,820—*thirty millions of dollars!!* for poor rates alone!! or more than double what it *ought* to take to defray the whole expenses of the American government; were it not that we are following fast in the wake of European monarchies, with useless and costly foreign missions, their military establishments, and military pensioners.

Now we would thank any free trade farmer in Maryland to calculate and let us know, how much of *agricultural produce* the Baltimore and Ohio Rail Road Company is about to import, in the form of rail road iron, to be laid down through the heart of the *coal and iron regions of Maryland*, and whether the men, who ought to be employed in Alleghany county, in delving the coal, and making the iron, needed for that great work, must not now go to raising wheat and corn, and mutton and beef, instead of being customers to the farmer for these agricultural products?

Our marvel is, that the paragraph which announces the fact, that the rail road company had been, on the score of economy, compelled to send abroad for such an amount of what God has given us the means to make at home, should have gone the rounds of the papers of Maryland, without an universal denunciation of a policy so at war with the agricultural interests of that State! Is it that farmers are like eels being skinned, so used to it that they think nothing of it? Verily it would so appear!

ROGERS' PATENT EXTRACTOR.

THE drawing below represents but one form of a machine claimed to be the simplest and cheapest invention for the extraction of the roots or stumps of trees. It is designed to be worked by two or more horses or oxen—some of them have more machinery, and all different fixtures, to be geared on, or off, according to the work to be done.



A. Bed Frame.
B. Tongue or Draft Bar.
C. Windlass.
D. Lever.
E. Chain or Rope.
F. *F'*. Pulleys or Shives.
G. Axle of the Wheels.
e. *e'*. Journals of Windlass.
H. *H'*. Position of Wheels during process of extraction.
h. *h'*. Hooks for chains.

Steam power or any other power may be applied. It is extremely useful to farmers, and often to railroad and common road contractors and others when grading near the surface, for extracting stumps and roots of trees from land; handling large stones, and other ponderous bodies. In many cases it does away with derricks, and is said to be superior to any machine for either of the above-mentioned purposes heretofore introduced, viz:—

In cheapness, simplicity, compactness, portability, quickness of operation, efficacy (it being able to overcome uncommon resistances), and convenience, in not only serving to take hold of, raise, and extract from the ground any considerable obstacle on the surface, but also performs the operation of loading the same upon itself as a carriage for conveying at pleasure.

Every 200 pounds of *power* is equal to ten tons of *weight* or *resistance*. When the lever is brought forward and secured in a horizontal position to the tongue or draft bar, the machine then becomes a carriage, being drawn by the tongue or draft bar. For purchasing patent rights for not less than one county, address, post paid,

JOHN ROGERS,
Derby Line, Vermont.

DOCTOR FRANKLIN ON MANUFACTURES, BEFORE THE REVOLUTION.

The following letter from Franklin to one of his friends is now almost eighty years old, yet it has only now been brought to light. We offer it now to our readers because we desire them to see that the truths we now desire to teach are the same that were taught by the fathers of the Revolution, as they have since been taught by Washington, Jefferson, Madison, Monroe, and Jackson, all of them Southern men and planters, but all of them wise enough to see that the true way to give value to land was to make a market on the land for its products. We especially desire to call their attention to the remark of this sagacious man, so long since made, that our power to produce must inevitably greatly exceed the power of Europe to consume our products, and to the effect of this difference in the *constantly diminishing* value of sugar, cotton, tobacco, and other agricultural products, as compared with the cloth and iron, as set forth in the third chapter of *The Harmony of Interests*, published in our January number, the necessary effect of a *dependence* for supplies upon people whose labour is less valuable than our own.

London, April 22d, 1771.

SIR:—I duly received your favours of the 4th of October and the 17th of November. It gave me pleasure to hear, that though the merchants had departed from their agreement of non-importation, the spirit of industry and frugality was likely to continue among the people. I am obliged to you for your concern on my account. The letters you mention gave great offence here; but that was not attended with the immediate ill-consequences to my interest that seem to have been hoped for by those that sent copies of them hither.

If our country people would well consider, that all they save in refusing to purchase foreign gewgaws, and in making their own apparel, being applied to the improvement of their plantations, would render those more profitable, as yielding a greater produce, I should hope they would persist resolutely in their present commendable industry and frugality. And there is still a farther consideration. The colonies that produce provisions grow very fast. But of the countries that take off those provisions, some do not increase at all, as the European nations; and others, as the West India Colonies, not in the same proportion. So that though the demand at present may be sufficient, it cannot long continue so. Every manufacturer encouraged in our country, makes part of a market for provisions within ourselves, and saves so much money to the country as must otherwise be exported to pay for the manufactures he supplies. Here, in England, it is well known and understood, that wherever a manufacture is established which employs a number of hands, it raises the value of lands in the neighbouring country all around it; partly by the greater demand near at hand for the produce of the land; and partly from the plenty of money drawn by the manufacturers to that part of the country. It seems, therefore, the interest of all our farmers and owners of lands, to encourage our young manufactures in preference to foreign ones imported among us from distant countries.

I am much obliged by your kind present of curious seeds. They were welcome gifts to some of my friends. I send you herewith some of the new barley lately introduced into this country, and now highly spoken of. I wish it may be found of use with us.

I was the more pleased to see in your letter the improvement of our paper, having had a principal share in establishing that manufacture among us many years ago, by the encouragement I gave it.

If in anything I can serve you here, it will be a pleasure to

Your obliged friend, and humble servant,

B. FRANKLIN.

To Mr. HUMPHRY MARSHALL, *West Bradford, Chester Co.*
per Capt. Osborne, with a brown paper parcel.

AMERICAN INTERESTS *versus* "THE PUBLIC OPINION IN ENGLAND."

The message also transmitted a second letter from Mr. Bulwer, dated

British Legation, Washington, Jan. 3, 1850.

SIR:—It having been represented to her majesty's government, that there is some idea on the part of the government of the United States, to increase the duties upon British iron imported into the United States, I have been instructed by her majesty's government to express to the United States government the hope that no addition will be made to the duties imposed by the present tariff of the United States, which already weigh heavily upon British productions, and I cannot but observe, for my own part, that an augmentation of the duties on British produce or manufactures made at a moment when the British government has, by a series of measures, been facilitating the commerce between the two countries, *would produce a very disagreeable effect upon the public opinion in England.* I avail myself, &c.

(Signed) HENRY L. BULWER.

The above annunciation, from her Britannic majesty's minister, well deserves the careful attention of our readers—that is, if plain plodding farmers and planters have any right or interest, in the transactions of government—and especially in the laws that regulate the terms of our commercial exchanges with foreign countries—a right and an interest, which some would seem to doubt, who raise the question, *What has an agricultural journal to do with political affairs?* For ourselves, in the case above presented—all unskilled as we are in the ways of diplomacy—we may venture to express our regret, that the accomplished secretary of state did not embrace the occasion, which this letter would seem to us to have fairly offered, not merely to acknowledge its receipt, but to show that he had fully "noted its contents!"

The President's message to Congress had not then been published in England, or if it had, not long enough before, for instructions predicated on a view of it, to have been sent to Mr. Bulwer; but it was doubtless in apprehension of the influence of the well known sentiments of the President, in respect of the protection needed for the development and fruition of *our own* natural resources, and especially our resources in the great articles of *coal* and *iron*, that these instructions were sent to the British minister.

We have, in fact, only to suppose that they would allow brother Jonathan a small portion of common sense, to see how naturally, and without any particular representation to her majesty's government, they would conceive that there might indeed, be "some idea on the part of the government of the United States to increase the duties upon British iron!"

Well enough do we know, that all beyond the clear and patriotic recommendation of the President on this subject, must be effected by legislation; that is, if we ever mean to show that this nation (not as a party but as a nation), has arrived at the conviction expressed by General Jackson, that "we have been too long subject to the policy of British merchants." Still as Sir Henry was not satisfied with fulfilling his instructions, to express the hope of her majesty's government, that "no addition will be made to the duties imposed by the present tariff of the United States," but proceeded to add, for his "own part," that any such addition would "produce a *very disagreeable effect upon the public opinion in England;*" would not our secretary then have been more than justified in replying, for *his* "own part," (with the permission of the President,) why it was that the government of the United States feels itself bound in the premises, to consult the public welfare of its own country, rather than the interests, and the public opinion of England? That is, on the supposition that the Hon. Secretary really entertains views on this

subject in harmony with those of the President and the head of our financial department.

How natural, and how exempt from all appearance of discourtesy would it have been, to indicate (in reply to the suggestion of "offence to British public opinion"); how incompatible with American interests, and how subservient to "the policy of British merchants" it is for us to go on forever leaving undisturbed in their beds, our own unlimited deposits of coal and iron, at the very time that we are importing, even into Alexandria, in view from Sir Henry's chamber windows, hundreds of thousands of dollars worth of beef and mutton and flour, in the shape of *English railroad iron* to be laid down through the coal and iron mines of Virginia! while her farmers are employed how? Why, reader, it was but a few days since, that in the streets of Washington, we stopped a man driving a wagon and four lean horses, to "worm it out o' the fellow" what he was about? and this was the result. He had brought from Virginia ¾ths of a cord of green wood, ten miles, paying toll going and coming, and was wandering over the ten miles square, to beg some one to take it at $1 75 cents for the load, and yet Virginians are crying out—"free trade"—"let us have free trade!"—let us import our iron from England, while England levies on our tobacco as much ($16,000,000) as *ought to pay* all the expenses of our government! her minister at the same time telling our secretary of state, that to raise the rate of duty on British iron, would be "*very* disagreeable to the public in England!" Ah! we are a wonderfully wise people, are we not?

Mr. Bulwer, at the time at which he penned this letter, was, no doubt, alarmed lest anything should be done calculated to affect "public opinion in England," and if such was his state of feeling, it must have been greatly increased by what has happened in the time that has since elapsed. For years, the people of that country had been told that the interests of land and labor were totally at variance with each other, and, during those years, the proportion of her population engaged in the work of transportation, conversion, and exchange, had been increasing as compared with that engaged in the work of production. The former was assured that to enable them to fare well and to grow rich, all that was needed was, that they should employ the "cheap labour" and the cheap lands of distant nations for the production of their food, in preference to the higher priced labour and lands at home, and after a long series of agitations, *protection was abolished.* What have been the results?* Have men obtained more food with less labour, or are they not

* For a view of the real condition of the English agricultural labourer, whose labour produces the beef and mutton, and potatoes, on which the labourer lives, who is employed in making the railroad iron that we import, the reader who has seen the "Harmony of Interests," by Mr. Carey, is referred to Part III., pages 113–14–15. It there appears, on undisputable evidence, that the weekly receipts and expenditures of a man for himself and family (nine in number) is as follows:—

	s.	*d.*
Rent of cabin,	1	
Tea,		6
Bacon,		5
Bread,	5	
Soda soap, &c.		5
Fuel,		8
Total	8—$2.	

The only provision for clothing is in the extra wages paid at harvest time, while the family cannot be treated to the luxury of bad butter, without sacrificing the tea, two ounces of which must serve for a week, the half pound of bacon which affords but a mere taste on Sunday to each, some of the bread, which is already but too scantily supplied, or a portion of their fuel, the absence of which renders their home still more

compelled to give more labour for less food? The answer is to be found in the fact that the agriculture of Ireland is already ruined—that extensive tracts of land, heretofore in cultivation, are entirely abandoned—that the number of agricultural occupiers has fallen from three hundred thousand to one hundred thousand—that the land of that country has almost ceased to be saleable at any price, however low—that the people have been driven to find abroad the subsistence denied to them at home—that England is filled with the fugitives, seeking employment at any price*—that wages are gradually falling "below even the lowest level of recent times"—that the power of purchase on the part of the people of England is smaller than it was five years since, notwithstanding the great increase of population—that men are becoming daily more superabundant, and that from week to week, and month to month there are produced new measures, having for their object the expulsion of the machine—Man—*by which alone can value be given to land.* The system has been tried and found wanting. Alarmed at its effects, the people, land owners and labourers, are now combining their exertions to bring about a change of both men and measures, the near approach of which is evident from the recent division in the House of Commons, where, in a full house, the vote for protection stood at 243 against, 264 favourable to a continuance of the present system, the majority of 21 being far less than the number of placemen, whose votes would, on the next day, have been given to a new ministry favourable to a re-enactment of the system of protection. The British minister may well be alarmed at the prospect before his political friends, for, unless we greatly err, that which is now apprehended must speedily be realized in the restoration to power of the party favourable to the protection of labour and land, recently constituting so small a minority, and battling with such enormous odds against them.

To understand the system that we are thus invited to maintain, we desire that our readers should peruse the following, taken from a recent publication of Mr. McCulloch, the highest authority in England:—

"The Americans *must* come to us for iron and cottons, and must, therefore, themselves, pay the duties on them. But we may supply ourselves with corn in fifty other places besides the Union, and, hence, the duty on it would fall entirely on the United States grower and exporter, and not on the English consumer."

"The Americans *must* come to us for iron," and they *must* come to us to sell their food, and we, therefore, can fix the price of both, says this great English political economist, and such is the system we call free trade. If we continue, as heretofore, to make little iron, and they continue, as heretofore, to produce much corn and cotton, they must continue to give us a

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cheerless and desolate; sugar, too, is out of the question, without trenching upon items more absolutely necessary. Nor is there any reserved funds for medicines, too often required by a family of nine, thus miserably situated. Yet this is, beyond all dispute, the condition of a vast number of English agricultural labourers, as reported on undoubted authority; and to make iron against English iron masters employing men thus situated, (the duty in this country being low when the price is low, and high when it is not needed,) we must bring our labourers down to this level, or we must raise the duty, which Sir Henry tells us on his "own part," will be "very disagreeable to the public opinion in England!"

The whole of this evidence of the condition of English agricultural labour, under their "free trade" system, will appear in The Plough, the Loom, and the Anvil, in the course of the publication of the "Harmony of Interests."

* "Thousands of able-bodied Irish are entering our island, turned from their work in consequence of the emigration of Irish tenantry, under free trade, in thousands, and are outbidding our native labourers already. I had, last week, a request from a strong Irishman, who has a house and his family in this country, to give him any work at *nine pence a day;* and have this day (Jan. 11) offers from stout Irishmen to drain and scour ditches for me *for their meat.*"—*Letter in Blackwood's Magazine,* Feb. 1850.

constantly increasing quantity of those products for a constantly diminishing one of ours, and to give us more labour for less labour! Such has been the system, and such, we beg our readers to see and understand for themselves, must it continue to be, unless we determine to make a market on the land for the products of the land, and supply ourselves with cloth and iron; making, at the same time, a market for the surplus labour of Europe, and thus raising the condition of those who fly and those who remain at home, enabling them to become better customers to both farmer and planter. Our farmers are invited to contend with the serfs of Russia for supplying with food a people, the larger portion of whom produce nothing to be given in exchange, being themselves occupied in the work of exchanging the produce of the labour of others. "Look," says an able writer whose book we would gladly see in the hands of all our readers—"look at the hundred provision retailers in a single street, each burning gas and life till twelve o'clock at night, to parcel out those commodities which one could do as easily. Take up a directory—count the number of shopkeepers in any town—London, for example. It seems as if one-half of the whole population consumed the substance of the community in the profit of mere distribution, producing actually nothing, except, indeed, heartburning, rivalry, envy of one another. What a fearful waste is here of the mind, the time, the industry, the skill of society."* Producing little, they can have little to consume, and hence it is that poor rates are growing with such fearful rapidity, while "the breed is fast degenerating," as the power of purchasing either food or clothing is steadily diminishing.

Our planters are invited to contend with the Hindoo for supplying with the materials for clothing, a people who are unable "to afford to spare any of their wages for clothes. They beg," says our author, "the cast-off garments of the Lord and Lady Bountifuls of the parish; if they buy at all, it is uniformly second-hand clothes; and the result of numerous inquiries by the Anti Corn-law League, has been to establish the fact that, ten, twelve, fifteen, or twenty years, are often the term of life, to which a single pair of breeches is renovated, refitted, and patched."†

The object of protection is that of diminishing the number of transporters and exchangers, and increasing the number of producers—thus increasing the quantity of good things to be divided, without increasing the number of persons among whom the division is to be made. The object of *the monopoly system of England* is that of increasing the transporters and exchangers, and diminishing the producers, with diminished return to the labour and capital of all, and the consequences are seen in the fact that our planters now give twice as much tobacco for the same quantity of iron, as they did fifteen years since, and our cotton planters, whenever they are so *unfortunate* as to have a fine season and a large crop, give *six times* as much cotton for *less* iron than they did thirty years since. Such has been, and must continue to be, the consequences of the system described by Mr. McCulloch, by aid of which, our people are *compelled* to go abroad to purchase iron, and equally *compelled* to go abroad to obtain a market for food and cotton. So long as it shall be permitted to continue, our farmers and planters must continue to impoverish themselves for the maintenance of the paupers and nobles who live out of the labour of the agriculturists of Great Britain and the world, and for that of the maintenance of fleets and armies employed in the work of compelling the farmers and planters of the world to continue to pay taxes for that purpose. We trust the day is not far distant when they will open their

* "The Mother Country," by Sydney Smith, p. 43.
† Ibid. p. 28.

eyes to the fact that the poverty of the producer is always in the ratio of his distance from the consumer, and that the remedy for all their evils, physical, moral, intellectual, and political, is to be found in bringing the loom and the anvil to the side of the plough and the harrow, thus making a market on the land for the products of the land.

ON THE PRESENCE, QUALITY, AND USES OF PEATS IN THE STATE OF MAINE.

The following very interesting letter shows that we were right in the persuasion that we might be opening up a subject of importance, especially to the New England States, where the temperature of the climate admits of the formation of *peat*.

For observations on the formation and action of peat, the reader is referred to Skinner's edition of Von Thaer's Principles of Agriculture (without which, there must be a large blank in every agricultural library), pages 171–273; also, and even more particularly, to Dana's Muck Manual.

Portland, February 11, 1850.

J. S. SKINNER, ESQ.

Dear Sir:—In the December number of your Magazine, you solicit information as to the extent and quality of the *peat beds* in our section of the Union.

Although not a practical agriculturist, I have given my attention more or less to this subject for a year past, and am satisfied that there are vast quantities of excellent peat in *Maine*, which would be of essential importance to agriculture here, if the requisite steps were taken to make known its fertilizing qualities. I am the better persuaded of this, after having read the article in your January number, respecting Mr. Jasper Rogers's experiments with *peat charcoal*. In this article, it seems to be fully proved that peat charcoal, aside from its fertilizing qualities, is a specific for the potato disease; and as the potato is one of the principal agricultural products of Maine, the subject deserves the particular attention of its citizens. I do not know that your magazine circulates very extensively in Maine, but I know that it ought to; and with the hope of exciting inquiry here as well as elsewhere, in regard to the matter of Mr. Rogers's inquiries, let me give you some account of the peat operations of two enlightened gentlemen of this section (Drs. J. D. Buzzell, and Geo. W. Smith), the which, as one of the Executive Committee of the Cumberland County Agricultural and Horticultural Society, I was specially called upon to examine last fall.

Some three or four years since, these gentlemen purchased, in the town of Cape Elizabeth, about six miles from Portland, a fresh water pond, covering an area of about 250 acres, having previously satisfied themselves that they could drain off the water, and that the soil thus to be reclaimed, if not underlaid by a bed of peat, would be of excellent quality for agricultural purposes. By means of a canal 230 rods in length, communicating with the ocean, the drainage was effected, and as handsome a field laid bare as ever tempted the eye of the agriculturist. However, before this field could be made available, it was found necessary to circumscribe it with a ditch to receive the waters from the uplands, which was accordingly done—the ditch being nearly three miles in length.

The soil thus reclaimed, for little more than a foot in depth, was found to be a mixture of decomposed peat, and other vegetable matter mixed with earth; and the whole rested upon a bed of peat, varying from ten to thirty feet in depth, which the Irish labourers pronounced to be equal, if not supe-

rior, in quality to any they had ever seen in their native island. Ninety acres of this land were planted with cranberry vines. These vines have not had time yet to come to full maturity, but at the time of my examination, many of them were laden with fruit of extraordinary size—the largest, indeed, I have ever seen. By way of experiment, likewise, about an acre was planted with strawberry vines, which, during a drouth last summer, which came near destroying the entire crops of this section, produced with wonderful abundance, most delicious fruit, and continued their produce for weeks after all other strawberries had disappeared from the market. You may form some judgment as to the quality of this fruit, from the fact that (while our common field berries were sold at from six to ten cents per quart), a fruit dealer here offered to purchase all that the proprietors could supply him with, at twenty cents per quart.

Experiments were tried also as to the effects of the soil or deposite, on the growth of potatoes on the uplands; and the result was most satisfactory. The field thus planted, even during the height of the drouth, looked as thrifty as any I ever saw; and being interested to know the result of the harvesting, I inquired, and ascertained that the produce was entirely free from rot, and most abundant. All this from peat in a *decomposed* state—when charred, I have no doubt (having read the article on the experiments of Mr. Rogers in your magazine), that it would be a much more powerful stimulant to vegetation.

But you say nothing about the *process of charring*, and all whom I have interrogated on the subject, are ignorant as to any particular method of so doing. Can you not in your next give such information as you have in this respect, so that those who are disposed may have an opportunity of experimenting with the article the coming spring?

In conclusion, let me add, that Drs. Buzzell and Smith have taken measures to introduce their peat into our market, as an article of fuel. They have invented a process for drying, by which it can be dried in twelve hours, whether dug in summer or winter, which process they are taking measures to have patented. Limited quantities sent to the Portland market last fall, were readily disposed of at $5 per cord; and among other uses it has been found an excellent substitute for charcoal, in kindling hard coal fires.

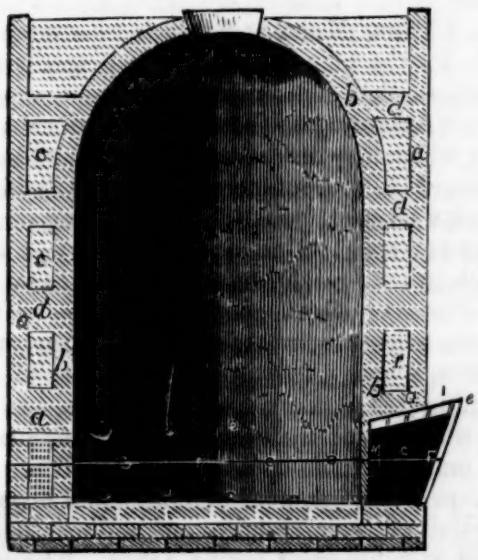
Very respectfully yours,
S. B. BECKETT.

The best description of the "*process of charring*," to which we can point our respected correspondent, is the following, which we extract from a volume we find in the Congressional Library—"KNAPP'S CHEMISTRY APPLIED TO THE ARTS," and to which our attention was kindly directed by Mr. DANA.

"OF THE PREPARATION OF PEAT CHARCOAL.—The charring of it is very much facilitated by two circumstances. The rectangular form of the peat bricks admit of their being piled up together, without leaving those interstices which is such a great objection in the wood-mound, and the lesser combustibility of peat charcoal renders such minute attention to the process unnecessary, and admits, with advantage, of the construction of heaps very much less in circumference. These consist generally of 700 to 1000 bricks; they are from 6 to 7 feet in diameter, and 4 feet high. Around the stake, which is driven into a dry place, the peat-bricks are arranged endwise in concentric series, forming circular layers, of which four, five, or six, with an internal decreasing diameter, are placed one above the other; with this precaution, however, that in all four directions, air-channels or passages, of the width of a brick, are left in the direction of the radius, by means of which the heat is afterwards regulated; otherwise the peat heat would be too closely

packed to allow any passage of air through its interstices. At the foot of the stake some dry wood is placed for ignition; the heap is covered with an inner coating of moss and leaves, and with an outer one of earth or charcoal dust, leaving only the middle part of the hood round the stake uncovered, for the purpose of setting fire to the heap by one of the passages. By opening and shutting these channels, the combustion is conducted in all directions, until flame breaks forth from the opening in the hood, which is then closed. The completion of the charring is then effected by apertures all round, beginning at the hood and proceeding foot by foot to the base. The appearance of the smoke issuing from these apertures is here also indication of the stage and state of the operation. The nature (age) of the peat, its consequent density, &c., must direct the burner. A mound, of the circumference stated, produced from not quite air-dried peat, 24 per cent. of the weight, and 27 of the bulk; from air-dried, 27 per cent. in weight, and 32½ in volume; from freshly dug Pfungstadt peat, 30 per cent. in weight, and 29 in bulk; from excellent peat, quite dry, 35½ of the weight, and 49 per cent. of the bulk. In the District of Siegen very good peat produced 23 per cent. of the weight, and 40 per cent. of the bulk. Experiments upon a small scale generally afford a still larger produce, sometimes as much as 40 per cent. of the weight. Much difficulty is attached to the drawing and quenching the peat charcoal, which are undertaken when the mound has cooled during a certain time, for the charcoal easily crumbles to powder, and is then useless.

In Furnaces.—The use of furnaces affords no increase of produce, but a safer regulation of the fire; and is more applicable to peat, as that substance is always obtained upon the same spot, and it is not necessary, as in the forest, to follow the charring or to transport the material. In the manufactory of arms at Obendorf, in Wirtemberg, there are charring furnaces which have stood the test of ten years' experience, and have been approved. Such a one is represented in Fig. 5. It is in the form of an upright cylinder, closed



at the top by a circular arch, 9 feet in height, and 5½ feet in diameter; containing 189 cubic feet. The furnace itself *b*, is surrounded by a second wall *a a*, in such a manner as to leave a space *c c*, which is filled up to the dome with sand, as a bad conductor of heat. Both walls are of brick, each one singly is 15 inches thick, as is the space *c c*, so that the entire thickness of the walls is 45 inches. *d d* are stones, placed longitudinally and perpendicularly,

to give greater solidity to the walls. Above the sole of the furnace are three rows of draught-holes, pieces of old gun barrels walled in, which can be closed with bottle-stoppers. The door for drawing out the charcoal can be closed by the cast iron slab *f*. The iron support of the door projects slightly forward, and can be closed in the front by a board *e*, and the space *m* then filled with sand from *g*. On charging, a channel is left in the axis of the furnace for igniting the contents. In the beginning the charging aperture *i*, and the lower draught-holes are left open, and as soon as the heat appears white hot, they are closed, and the upper ones opened. When all smoke has ceased, all the apertures must be closed or filled with sand, and a layer of sand placed over *i*, about one foot in thickness; this occurs in about forty or forty-eight hours, and then the furnace is left during six or seven days to cool.

That no interruption may occur, ten such furnaces are worked at the same time. Peat charcoal, as far as heating power is concerned, ranks amongst the best kind of fuel; it possesses, however, at the same time, properties which render it unfit for many purposes. If 100 lbs. of peat have 21 lbs. of ash, and produce 47 lbs. of charcoal, these 47 lbs. of peat charcoal will contain 21 lbs. of ash, *i. e.* 45 p. c., which affect the processes in which it is employed, *e. g.* forging; partly on account of its quantity, and partly by entering into fusion, and acting chemically upon the bodies to be heated. As most kind of peats are rich in ash, this must be augmented to such an extent in the charcoal, as to render the greater number of them unfit for carbonization. Another great objection to peat charcoal, is its loose, brittle character, which causes it soon to fall to pieces, and become useless. In high smelting furnaces, the pressure of the layers of ore suffices to crush it; its application is, therefore, confined to open boilers and forge fires. This want of firmness has been found to render this charcoal quite unfit for removal, and the carbonization must be effected on the spot where the charcoal is used.

This exposition having already occupied as much space as can well be spared for the subject in this number, we must defer to our next some extracts from "DANA'S MUCK MANUAL," which we apprehend may be out of print, and of which, for the sake of that salutary spirit of inquiry which is abroad over the land, another edition cannot too soon appear.

The author says—"According to the experience of Mr. PHINNEY, of Lexington, an authority which may not be questioned" (and to which we may now add, one not to be referred to without mournful respect for his virtues and intelligence as a citizen and a farmer), "a cord of green dung converts twice its bulk of peat into a manure of equal value to itself—that is, a cord of clear stable dung, composted with two of peat, forms a manure of equal value to three cords of green dung." Professor Dana goes on to say—"Mr. George Robbins, of Watertown, is an extensive manufacturer of soap and candles, and of starch, and still better, a man who employs the refuse of these trades, in enriching and gladdening his lands. For four years, and it is believed his crops will compare with any of the best cultivators around him, he has not used a spoonful of manure, made by any animal walking either on two legs or on four. He keeps a large number of horses and hogs, and several cows; he uses not a shovelfull of their manure, but selling that, he uses *peat and swamp muck*, mixed with his spent barilla ashes. The proportions are one part of spent ashes, to three of peat, dug up in the fall, mixed in the spring. After shoveling two or three times, it is spread and ploughed in. The effect is immediate, and so far lasting. The effects of this spent ashes alone on sandy loam are excellent; it makes the whole quite 'salvy.'"

VON THAER says—"If peat dust has remained in heaps for a long time,

it may be used as a manure, without the addition of any mixture, and is peculiarly adapted for the amelioration of argillaceous and tenacious soils."

Professor Johnson, from whom we shall quote more fully when we revert to this subject in some subsequent number, says, "In the preparation of peat ashes for manure, two practical rules ought to be attended to:

"1. Not to burn the peat too far, or to a clean ash; if it be in a sufficiently fine powder, an entire half of the charcoal may be advantageously left.

"2. When burned, remove it under cover, or protect it from the action of the rains as quickly as possible, that the soluble salts, upon which so much of its virtue depends, may not be washed out of it. How often," he adds, "are wood and other ashes left in heaps upon a field, until the rains have exhausted them of nearly all of their most valuable ingredients?"

We might here dwell on the vast resources of swamp muck within the reach of those who live on the tide-water marshes of old Maryland, where our thoughts so often, and as it were involuntarily, carry us—but *cui bono*—to what end? Where people, sparsely settled, make only corn and wheat, and sell by the pound or bushel, against those in manufacturing States where there is demand for things that are sold by the *ton*, they can hardly afford the expense of hauling stable manure itself, a mile from the place of its origin or deposit. It's "population that makes the food come out of the ground," and it's diversity of employment that ensures population. When we asked the lamented and exemplary Phinney—"Sir, where do you find sale for your $2000 worth of apples from this orchard?" What was his answer? "Have I not here at Lowell, close at hand, 30,000 mouths, hungry for all the fruit I can send them?"

Portland, March 12th, 1850.

THE accompanying box contains a sample of peat and peat-charcoal, manufactured from the same kind of peat. It was taken from the great pond in Cape Elizabeth, about six miles from this city.

I would give you some account of the premises if I had not understood that Mr. S. C. Beckett had already done it.

We have tried some experiments on a small scale to test the "deodorizing" power of the charcoal, and we find it to confirm all that Mr. Rogers and others have said of the Irish peat-charcoal.

As soon as the season is sufficiently advanced, we intend making further experiments as to its deodorizing powers, and to test it fully as to its properties as a fertilizer. Should these be as fully sustained by experiments as they have been as a deodorizer, it will be invaluable to the agriculturist and to the horticulturist.

We shall report to you, in the course of the ensuing season, the results of our experience.

Respectfully yours,

J. MERRILL, *Clerk.*

OSAGE ORANGE HEDGES.

The distance and mode of setting these plants in the row, says the Ohio Cultivator, is commonly six to seven inches apart in a single line. But where a very close hedge is desired, as around a garden or fruit yard, we prefer to set the plants in two rows, one foot apart, and the plants a foot apart in each row; those in one row opposite the vacancies in the other, thus—

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PRODUCTS AND PROSPECTS OF THE GREAT WEST.

VERY interesting expositions are always to be found in the Cincinnati Price Current, illustrative of the trade and growth of the great west—a great world in itself.

Speaking of the flux and reflux of currency from the west to California and back again, it says, among many other things that would be interesting to Atlantic readers—One express house in New York reports that out of 500 distinct remittances made through them, over 200 were to female relatives of absent diggers. The sums remitted, though severally small, are in the aggregate quite important, and as the precious metal finds its way into the channels of trade from the several homes of the adventurers, its effect upon business will be the same as if it had been produced in the United States.

Of the $12,000,000 of California gold received in the United States up to this time, it is estimated that $6,000,000 has come to different families scattered in the interior; and of this sum the west gets a fair proportion. So far, therefore, as the market has been affected by the withdrawal of currency for the supply of California emigrants, it will be fully relieved by the influx of the products of the mines.

The exports of breadstuffs from the United States to Great Britain and Ireland, from the 1st of September, 1849, to about the 1st instant, were as follows, compared with the exports same time last season:

	Flour, bbls.	Meal, bbls.	Wheat, bus.	Corn, bus.
1848–49, . . .	726,979	61,034	956,419	6,751,514
1849–50, . . .	268,276	2,212	430,329	1,778,142
Deficiency, . .	458,703	58,822	526,090	4,973,372

From this it is evident that the United States is, this year, contributing but little to feed the operatives of England.

And then of iron, it says—

IRON.—The sales of pig have been confined to small lots, at $25*a*26 for Ohio river hot blast, varying according to length of time and class of paper. Received during the week, 197 tons; since Sept. 1st, 9438, against 8901 same time last year.

Now, how obviously much better to be feeding here, in our own country, the hundreds of thousands employed in making iron for us in Europe.

GRAIN.—The market presents no new feature—Wheat is nominally 90*a*95c.; Corn is in good demand at 35*a*37c.; Oats 32 c.; Rye 80*a*90; Barley 75 to 95—including inferior and choice.

The following very interesting item is from the Cincinnati Chronicle and Atlas:—

GRAPE CULTURE.—Robert Buchanan, Esq. has published an interesting statistical article relative to the culture of the grape in this vicinity, from which we make the following extract:—

Some six months ago, the Cincinnati Horticultural Society appointed a committee, of which Dr. Mosher is chairman, to take a statistical account of the vineyards in this vicinity. The report is not yet completed, but the following estimate of the aggregate has been furnished, and is supposed to be nearly accurate, viz: Number of acres in vineyard culture within a circle of twenty miles round Cincinnati, 7743; under charge of 264 proprietors and tenants. Of this, Mr. Longworth owns 122½ acres, cultivated by 27 tenants.

At the low estimate of $200 per acre for cost of planting, &c., this would amount to $148,600 exclusive of the value of the land; and, when in full bearing, produce, at the most moderate estimate for a series of years (of 200 gallons to the acre), 148,000 gallons of wine annually; but in good seasons much more.

The number of acres now in bearing is a little over 340. The average distance apart in the rows, 3 by 6 feet, making 2400 plants to the acre.

The average product to the acre in 1848, was about 300 gallons, from near 280 acres then in bearing; and in 1849 (the worst year for rot yet known), about 100 gallons to the acre, from some 360 acres. New vineyards produced 200 to 250 gallons, but the old only 50 to 100; and the crops of a few were entirely destroyed by the rot.

Mr. A. Liggett, of Ripley, Ohio, has obligingly furnished the statistics of the vineyards in that neighbourhood. There are 73 acres planted, and 13 proprietors—about one-half the vines in bearing. The distance apart in the rows, 3 by 6 feet—the quantity of wine made in 1848 and 1849, about the same to the acre as in this vicinity, and the rot equally destructive.

According to this calculation, there are 816 acres in grape vine around Cincinnati and

Ripley. In a year or two there will be produced 244,800 gallons of wine from the vineyards, equivalent to about 8,000 barrels, and will constitute an item of about $200,000 in the domestic business of the city. In 1840 there were 11,526 gallons of wine made in the State of Ohio, of which two-thirds were made in the county of Richland, and only about 2,000 in the county of Hamilton. It will thus be seen that the vineyards of this neighbourhood are the creation of the last ten years.

It is well settled that the *Catawba* is, on the whole, the best grape for cultivation yet tried in this vicinity. It is probable, too, that the hill sides, extending from a little below Cincinnati to Portsmouth, will be found the best region for the successful culture of the grape, to be obtained in the central states. We do not say that other sections will not do, but only that it combines the most advantages.

We are not of those who think that wine is not alcohol; for we know that it is to a large extent; but we also know that it is the weakest, and the least mischievous of the various forms of that (to the human body) most pernicious article.

☞ As many of our readers in various parts of the country are desirous of commencing the cultivation of the grape, the following from the pen of R. Buchanan, Esq., ex-president of the Cincinnati Horticultural Society, and published in Cist's Advertiser, will be interesting and valuable to them:—

CULTURE OF THE GRAPE.

CINCINNATI, *Feb.* 10, 1849.

DEAR SIR:—At your request, I now give you the mode adopted by myself, and some others in this vicinity, in cultivating the vine for wine making.

At the same time, I feel that it would come with greater propriety from Mr. Longworth, to whom, more than to any other man in the West, we are all indebted for our knowledge in grape culture.

Selecting and preparing the ground.—A hill side, with a southern aspect, is preferred. If the declivity is gentle, it can be drained by sodded, concave avenues; but, if too steep for that, it must be benched or terraced, which is more expensive.

In the autumn and winter, dig or trench the ground with a spade all over, two feet deep, turning the surface under. The ground will be mellowed by the frosts of winter.

Planting.—Lay off the ground in rows, three by six feet; put down a stick twelve or fifteen inches long, where each vine is to grow.

The avenues shall be ten feet wide, dividing the vineyard into squares of one hundred and twenty feet. Plant at each stick two cuttings, separated five or eight inches at the bottom of the hole, but joined at the top—throw a spadeful of rich vegetable mould into each hole, and let the top eye of the cutting be even with the surface of the ground, and, if the matter is dry, cover with half an inch of light earth.

The cuttings should be prepared for planting by burying them in the earth immediately after pruning from the vines in the spring; and, by the latter end of March or early in April, which is the right time for planting, the buds will be swelled so as to make them strike root with great certainty. Cut off close to the joint at the lower end, and about an inch in all above the upper.

Pruning.—The first year after planting, cut the vines down to a single eye (some leave two); the second, leave two or three; and the third, three or four. After the first year, a stake six and a half or seven feet long must be driven firmly down by each plant, to which the vines must be kept neatly tied with willow or straw as they grow. Late in February, or early in March, is the right time for spring pruning in this climate.

Summer pruning consists in breaking off the lateral sprouts and shoots, so as to leave two strong and thrifty canes or vines—one of which is to bear fruit the ensuing season, and the other to be cut down in spring pruning to a spur to produce new shoots. These may be let to run to the top of the stakes, and trained from one to the other, until the wood is matured, say in August or September, when the green ends may be broken off. One of these vines is selected next spring for bearing fruit, and cut down to four to six joints, and bent over and fastened to the stake in the form of a bow. The other is cut away, as well as the fruit bearing wood of the last year, leaving spurs to throw out new wood for the next, and thus keeping the vine down to within one and a half to two feet of the ground. Nip off the ends of the fruit bearing branches two or three joints beyond the bunches of grapes, but do not take off any leaves.

If both the cuttings grow take one up, or cut it off under ground, as but one vine should be left to each stake.

Culture.—The vineyard must be kept perfectly clean from weeds and grass, and hoed two or three times during the season. Keep the grass, in the avenues around, down

close. About every third year put in manure, by a trench the width of a spade, and three or four inches deep, just above and near each row; fill in with two or three inches of manure and cover up with earth.

Wine making.—Gather the grapes when very ripe, pick off the unsound and unripe berries. The bunches are then mashed in a mashing tub, or pressed through a small mill, breaking the skin but not the seed, and thrown into the press, and the screw applied until the skins are pressed dry.

Fermentation.—This process is very simple. The juice is put into clean casks in a cool cellar, and the casks filled within about four or five inches of the bung, and the bung put on loosely. The gas escapes, but the wine does not run over. In from two to four weeks, generally, the fermentation ceases, and the wine clears; then fill up the casks and tighten the bungs. In February or March, rack off into clear casks. In the spring, a moderate fermentation will again take place; after that, the wine fines itself, and is ready for bottling or barreling. Use no *brandy* or *sugar*, if the grapes are sound and well ripened. Keep bunged up or corked tight, and in a cool cellar, and the wine will improve by age for many years.

R. BUCHANAN.

Mr. Charles Cist.

STATISTICS.

Cost of my vineyard of six acres—fourteen thousand four hundred vines:

Trenching, two feet deep, $65 per acre	$390
Sodding avenues	60
Cost of 30,000 cuttings, at $2 50 per thousand	75
Planting	70
Fourteen thousand five hundred locust stakes, at $3 per hundred	435
Setting 14,500	55
	$1,085
Cost of attending the first year—vine dresser $216, and a hand for one month	$231
Second year—vine dresser $216, and a hand for two months, at $15 per month	246
Cuttings after first year, to replace failures, say	20
Hauling, carting, &c.	68
Contingencies, &c.	150
Average cost, say $300 per acre	$1,800

The third year the vines will produce grapes enough to pay the expense of that year; generally more.

For the fourth year, and a series of eight or ten years in succession, the experience of the past would indicate the following calculation to be something like a fair one:

Say six acres, average 250 gallons, at rates heretofore, $1 per gallon		$1,500
Deduct cost of vine dresser per annum	$240	
Assistance, hoeing, &c.	60	
Gathering grapes, and pressing	150	
		450
Net profit per annum		$1,050

To attain this, the vineyard must be favourably situated, and well attended by a competent vine dresser, and free from the disastrous visitation of the rot.

Vine culture in this vicinity.—It is estimated that over three hundred acres are now planted with the vine, within a circuit twelve miles round Cincinnati; nearly two-thirds of which were in bearing last year, producing, notwithstanding the rot, so injurious to many, about 50,000 to 60,000 gallons of wine.

The Catawba is our *great* wine grape, and principally cultivated. The Isabella is not preferable for wine, and is only used for table use.

Mr. Longworth, with unwearied zeal and liberality, is still experimenting with new varieties, and may yet find a rival for the Catawba.

R. BUCHANAN.

Mr. Charles Cist.

N. B. Some vineyards, in good seasons, have produced at the rate of 600 to 800 gallons to the acre; but this is rare. The usual yield is 300 to 400 gallons, where there is but

little rot. A bushel of grapes, if well ripened, will produce three and a half to four gallons of wine.

By proper economy, a man may have a vineyard of several acres in a few years, without feeling the expense to be burdensome. Commence by trenching one acre in the winter, and planting it out in the spring; next year another acre, and so on, for five or six years. After the first year, he will have his own cuttings from the first acre, and also grapes enough to pay for the cost of planting the succeeding additions to his vineyard.

If he has suitable timber on his own land, the stakes can be got out in the winter with but little outlay in money. By this course, the cost of a vineyard of six acres would not be half as much as mine.

Some prefer planting in rows, four by five—others, four and a half by four and a half; and, on level land, three and a half by six, or even seven feet.

I have merely given, in the foregoing remarks, the course pursued by myself and some of my neighbours, without pretending that it is preferable to others.

R. B.

A PRIZE CUP FOR POTATOES.

Mr. Darius Clagett, of Washington, we are glad to see, has turned farmer as well as merchant, and the more certainly to succeed, has "settled" near, and taken as his fugleman the farmer of "Silver Spring," distinguished over *the globe* for activity and success in that department; meaning to leave it with the reader to inquire—which? As straws show which way the wind blows, Mr. C. had evinced in his garden plat in Washington, a decided taste for planting, and budding, and pruning, and cultivating. But who can farm against men that have silver springs, or springs of silver? springs, that, moreover, in hot weather, seem to make spontaneous offerings of cool melons and cooler wine? But, *revenons à nos pommes de terre.* Mr. Clagett proposes in the *American Farmer*, aforesaid, as follows:—

"What I have to propose is, simply, that any number of persons, within the State of Maryland and the District of Columbia, may enter into competition, by a *cash* contribution of *one dollar* each, to be deposited with yourself, and any agents you may appoint, and to be expended in the purchase of plate, to be awarded (by a committee appointed for the purpose) *to him* or *her* who shall produce and exhibit, at the next agricultural fair, twenty-five of the largest potatoes—a description of the "modus operandi" of the preparing, planting, and growing of them, to accompany every sample exhibited; and *all* the surplus of potatoes (after the award) to be given to you for your trouble.

"I have now given you an outline of what I propose; and, if it meets with your approbation, the details of the same will be the subject of another letter.

"I, therefore, conclude this preface, by tendering you the compliments of the season, and wishing you the same success in your praiseworthy endeavours that attends those who *read* and *digest* the result of your labours.

"Very respectfully, your ob't serv't,
"D. Clagett."

[We concur in Mr. Clagett's proposition, and accept the agency proposed, but think he should extend the area of competition to the farmers of other States.—Ed. A. F.]

We add, most respectfully, that we can't say we do exactly "concur."

We have no great opinion of giving encouragment to the system of forcing things into monstrous sizes, whether it be animal, fowl, or vegetable. And, besides, we have found that the largest potatoes are apt to be *hollow hearted!* and that is a quality of too common growth already in a certain district, where some men who in youth and prosperity were feasted, and courted; in age and poverty scarcely meet with the commonest "how d'ye do!"

We should think that the prize would lead to more useful experiments and results, if offered for the *best new variety of potatoes to be produced from the seed.*

On the utility of *this*, we have not room now to remark; but, we think we can promise some instruction from an honourable M. C. as to the process for obtaining new varieties in that way. It will, of course, be understood, that while we may be mistaken in our views—whether so or not, we none the less appreciate the zeal and good intentions of Mr. Clagett, whom we congratulate on becoming one of the "*hard fisted.*" Quite sure are we, that neither he nor his neighbour aforesaid, will ever belong to that other and very different fraternity, the "close fisted!"

GOOD CORN CROPS IN LORAIN COUNTY.

FRIEND BATEHAM.—I noticed in your paper of October 15th, an account of a large corn crop by John Eversole, of Perry county, viz.: one hundred and twenty-five bushels on one acre. I think Mr. Eversole has done well, but he has come short of what we have done on the Reserve this season.

I have raised this present season on one acre of sod ground, in round numbers, one hundred and fifty bushels, allowing three half bushels of ears to make one bushel of shelled corn. This crop of corn was raised on Black River bottom land; planted in rows three feet apart each way, with three stalks in a hill. And this is not the largest crop of corn raised this year on the Reserve. One of my neighbours, Pliney Jackson, raised on one acre of land one hundred and fifty-four bushels of corn, for which he drew the first premium at our county Fair, and I drew the second premium. If any one has beat this in the Buckeye State, we should like to hear of it.

Yours truly,
JOSEPH WORCESTER.

Pittsfield, Lorain County, O., Nov. 1849.

And we, too, "should like to hear" which is most needed for these good farmers in Ohio? Is it to be told how they can make, and to be singled out for the highest distinction an agricultural *society* has to bestow when a man does make, half a bushel more on an acre? *or*, do they need *laws*, that shall exclude from naked competition with them, those over-worked, poor half-starved wretches in Europe, who, with the product of their agricultural labour, supply with all their provisions and clothing, the men who are *there*, making cloth and iron, to be *consumed in Ohio!* See the Baltimore and Ohio Rail Road Company, sending to England for some 20 or 30,000 tons of railroad iron to connect the seaboard with *Ohio!* Now every ton of this iron may be said to be manufactured, in fact, almost exclusively out of *bread and meat*, not a particle of which was made in America! Nearly every dollar of the money paid to all the labourers employed in the manufacture of this iron, from the digging the ore to the finish of the rail, was expended for *food and clothing*. The profit goes to the English iron master, who can afford to live on former accumulations from his immense capital, if the American government will only aid him, by its low and its ad valorem duties, in thoroughly breaking down the iron establishments in the United States. That once done, and thereafter, the English manufacturer can *charge his own prices*, because iron founderies are not to be built up in a day. They require much capital that men will not risk again and again, after having seen so many ruined by the faithless and fluctuating policy of their own government, making the duty low when the price is low, and high when the price is highest, thus legislating against, instead of for, the American manufacturer. For what use were the bowels of the Alleghany mountains (unfitted for culture) filled, by the hand of God, with coal and iron? Did he intend that it should not be used, unless it could be done in successful competition with the miserable labourers of Europe, where the poorhouses are filled at an annual cost to the people of $30,000,000 of taxes a year, to barely save the lives of men, women, and children, who can't get work at a shilling a-day? Was it in this way that Providence designed our country should be blessed by these magnificent and unlimited deposits of coal and iron? No, No! The Ohio farmer, who already knows, as it is seen here, how to make 150 bushels of corn on an acre of land, needs now to be taught something more. He needs now to be rescued out of the hands of demagogues, he needs now to have the *party* spectacles (in which we may all be said to be born in this country), stripped from his face, and to be told to hold up his head like a man; to inquire and to think independently for himself until he solves the question not, how shall we make more, but how shall we bring the prosperous customers close around us to demand what we do make, with ability to pay for it! How

shall we realize the advice of Jefferson, to "place the manufacturer by the side of the agriculturist?"

That is what every farmer in the Union needs now to know, and that is to be done, by taking this question out of the *party ring* and viewing it as a *national question*, one between England and the United States—in fact, a question of *national independence!* Independence did we write? We shall never be truly independent until a national determination is formed, and carried out in the legislation of the country, never to import a yard of cloth, or a pound of iron, or anything else for which our country abounds in the natural resources. We must determine that he who manufactures cloth and iron for the American farmer, shall eat the American farmer's corn and beef, and weave the American farmer's wool. Do that and he will be sure to find out how best to produce the beef, and corn, and wool.

HUSSEY'S REAPING MACHINE.

A FEW days since, the first twenty miles of the road from Baltimore to Philadelphia was very agreeably beguiled and shortened in the perusal of the March number of the old father of agricultural journals, the AMERICAN FARMER. Were we to eviscerate and divest it of all that is worthy of notice, we should leave not even the outside skin, for we ought to venerate even that. How well we remember the suggestion for the motto, at a hospitable Irishman's always lively dinner-table, in Baltimore, by an Irish clergyman,

"As jolly an old soul
As e'er crack'd a bottle or fathom'd a bowl."

We were glad to see, in the number referred to, the following. By transferring it to our columns, we seek to do service to a man more worthy of honour for this invention than many a man who has received public honours and rewards, and the "privilege" of the Senate chamber.

"HUSSEY'S REAPING AND MOWING MACHINE.—We call attention to the advertisement of our fellow townsman, Mr. Hussey, who is now ready to receive and execute orders for his Reaping and Mowing Machine. We *may* be biassed in our judgment in behalf of this invention of our friend Hussey, but we think we may with full confidence say, that from all the evidences which have come under our observation, it is a superior machine to everything of the kind that has ever been presented to the public."

QUINOA PLANT.

"To the Editor of the Plough, Loom, and Anvil.

"SIR—As I believe it to be your object to introduce to the notice of your readers, all improvements likely to promote the interest of the labourers in the several departments to which your periodical is devoted, I beg leave to mention a plant not hitherto generally introduced into the 'States.' I mean the Quinoa plant (Chenopodium Quinoa). It belongs to that celebrated tribe of which the Beets are familiar representatives, but unlike these, its utility depends on its seeds rather than roots. The seeds are white, smooth and round, not unlike the Sago in appearance, and when carefully cooked produce a very nutritious aliment, delicate and wholesome. It is used as a common article of food in Peru (Lindl. Veg. Kingdom). I understand this plant has been already introduced at Baltimore as a crop. I have myself seen it in cultivation in Europe, where it was introduced as a probable substitute for the potato, at the time when that essential root exhibited proofs of decay. I enclose a small quantity of seed grown in the Royal Dublin Society's Garden, Glasnevin, Ireland, in latitude 51°. If you are familiar with the plant, of course these remarks are unnecessary; if not, I will be ready at any time to furnish more minute details as to its use and culture. Should any one wish to try it, I have every reason to suppose that seeds may be procured from your friend R. Buist, Philadelphia, who generally introduces such things to notice.—HORTOPHILUS.

"*Philadelphia, March 21st*, 1850."

We should be glad to have further information, and in the mean time, have sent the seed to Mr. Colt, Roswell House, Paterson, N. J., where it is sure of careful attention.

HOW FREE TRADE, RECOMMENDED TO AMERICAN FARMERS, WORKS IN ENGLAND.—In the year 1834, the county rate of taxes in Lancashire, England, was 6 cents on the $5 upon an assessment of $20,000,000—now it is 16 cents on the $5 upon an assessment of $30,000,000!

HOW TO MAKE A MARKET ON THE LAND FOR THE PRODUCTS OF THE LAND.

THE great object we have in view, is that of teaching the farmers and planters of the Union, how to give value to *their own* labour and *their own land*, and thus to become rich, instead of remaining poor. The process by which all this is accomplished in New England is so simple, and is so well described in the following account* of the rise and progress of one of their manufacturing villages, that we cannot omit the opportunity to present it to the view of southern and western readers, in the hope that it may tend to influence them to "go and do likewise."

About a dozen years ago, in an adjoining town, a young man about twenty years of age, got it in his head that he could make a power loom for weaving coach lace. He had no money, but his brother, a year or two older, who was an operative in a small factory in the neighbourhood, had accumulated a few hundred dollars, and having full faith in his brother's genius, lent his assistance. The young man succeeded with his loom. People came to look at it, and saw that it was good. Boston merchants and capitalists came, and saw that it would pay, and they took stock it in. The young man, encouraged by success, and having his faculties sharpened by exercise, went to work upon a loom for weaving figured counterpanes. This succeeded also. Next he tried his hand at an ingrain carpet loom. That went to Lowell, and consequently, did not help to build up this place (except, inasmuch as it increased confidence in his abilities), although it is making employment for a thousand persons there. Afterwards he got up a gingham loom, which was equally successful. Well, he determined that his machines should be operated here. Capital was ready to pay the bills, for it saw a prospect of large returns, and this man and his brother, the operative, went to work. They built a machine shop in order that their work might be done under their own inspection; then they built machinery and put up mills; and within the last six years, nearly two millions have been invested here under their direction. A village of three thousand inhabitants has sprung up, in the midst of what was a few years ago, woods and barren sheep pastures. But how? As soon as it was known that work was to be done here, and money paid for it, Yankee enterprise straightway pricks up its ears and starts. The carpenters, bricklayers, stone masons, iron founders, machinists, flock in. In their train follow tailors, shoemakers, butchers, bakers, and shop keepers. Some are young and poor, just commencing business, others are older and have got a thousand or two of dollars. But they can do better here than at home. Those who have children of a suitable age, put them at work in the mills, as places occur for them, a portion of the year. Then the farmers all about the neighbourhood—the citizens who do not come themselves—the doctors, lawyers, and ministers, even—find their girls and boys have got the factory fever. The wages are so good—and paid every four or five weeks, too—sisters, cousins, acquaintances are going—if they shouldn't happen to like it they can go home again—in short, they *must* go to the factory, and will! Occasionally, some of the parents, who are not getting along quite as well as they wish, come over to see what the prospect is. They find "it's handy to meetin'" (we have three or four churches), "schoolin's so much better'n 'tis up our way" (we have five or six schools, primary, grammar, and high), that they determine they will move to the factory village and take a boarding house, so as to be with their children and enjoy the advantages of a larger community. The persons who came first, meantime, are getting rich, and men of note. They are being elected representatives, selectmen, or filling other respectable stations—but they see no impropriety in their children spending a portion of their time in the factory. They send them to school three, six or nine months in the year, and the remainder of the time keep them at work. The young folks much prefer the mill to the work about the house at home. Their brothers, cousins, lovers, friends or acquaintances, are their overseers, and their fellow operatives are of the same character. And thus our factory village springs up, and thus its mills are filled—a large proportion of the operatives, however, always belonging to homes in the neighbouring towns or states, whence they come to spend a year or two in the mill and then return to marry some early acquaintance, or marrying at the village, establish themselves in a new home.

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* From a letter by Mr. C. W. Blanchard, of Clintonville Mass., in reply to one addressed to him by the Hon. Mr. Clemens, Senator from Alabama.

For "The Plough, Loom, and Anvil."

Since we appeared before the readers of "The Plough, Loom, and Anvil," the weather has, in this quarter, been inoperative for the farmer, although considerable ploughing has been done. Early potatoes and some oat crops have been put in.

The gardener has been busy putting in his first crop of radishes, now above ground; onions are both sown and planted; early beets and peas vegetating; cabbage and lettuces planted out, and orchards have been laid out and filled with fruit trees; some of them left to be blown about at the mercy of the elements; whilst the careful and considerate have tied them to stakes. We have planted a pear orchard, or, at least, one hundred and fifty trees, and feel satisfied, if we be spared six months, we may eat the fruit thereof. We also planted, along one of our naked fences, one quarter of a mile long, a collection of apple trees, going in fully for some one to eat the fruit thereof; and, before the month closes, we shall have covered another fence with grape vines.

In gardening, it is all important to plant and sow early. Where our hints, last month, have not been attended to, delay no longer to do so. Early vegetables for your family and friends, is a boon admitted by all. The season will now admit of sowing early horn carrots, Mohawk and Valentine beans. Sow drumhead cabbage, to grow for *cold-slaugh;* red Dutch for pickling, and large York or sugar-loaf for summer use. Prepare ground for a full sowing of carrots, both for garden and field culture; sow celery for a late crop; plant long green cucumbers towards the end of the month, cover them at night with a box, glass, or litter; sow beds of lettuce and endive, onions, and parsley. A pound of onion-seed will cost $1 75, and will produce two bushels sets, which, sold in market at twenty cents per quart, will bring over $12, and will not cost in labour and land over $2 50. Where there are no onion sets, sow a portion of the seed very thin, say one inch apart; manure well and you will have large onions. The first season, sow yellow and white summer radishes in rows nine inches apart, and round spinach fifteen inches from row to row. Do not fail to be forwarding your tomato plants by every possible protection. Egg plants must now be sown, if not already done; dig a pit in the ground eighteen inches deep and three by six feet, put therein a load of warm manure, so as to be a few inches below the surface; lay thereon six inches of fine soil, sow the seed, cover it at night with boards, mats, straw, or hay, which will protect and bring both tomatoes and egg plants forward rapidly. Prepare poles for running beans, and be sure you have the *genuine Lima*, which has no rival!

Flowers—those cheerful and intellectual companions of country life, must not be overlooked; a few cents, spent in seed, will afford a treat during the entire season. Sow *German Asters, Sweet Alyssum, Balsams, Cacalia* (*Ladies' Paint Brush*), *Campanula Clarkia, Centaurea, Convolvulus, Calliopsis, Chinese and Spanish Pink Gilia, Candytuft, Cypress Vine* (red and white), *Malope.* German stocks, Nemophila, Wood Nymph, Spanish Nigella, Petunias, Red and White Drummonds, Phlox Schizanthus, Red, White, and Yellow Portulacas, Rocket Larkspur, Thunbergia, Viscaria, French Marygold, and Tinnias—to which may be added for curiosity, Ice and Sensitive plants—these are flowers for the *million*, and last one year only. The following are of a more permanent character, and last from year to year—as Campanula, Chelone, Chrysanthemum, Delphinium, *Dragon's head* (*Dracocephalum*), Day Lily, Blue, White, and Yellow Lilies, *Phlox* (red, white, and striped), Pœonias of all colours, Pentstemons, Rudbeckias, Spiræas, and Speed wells (*Veronica*), all very desirable, and can be bought for a shilling a plant at the nursery. Now is the time to plant, and delay not!!

Fruit Garden.—We consider March and April the best months in the year for planting—Strawberries, choose Boston Pine, Early May, Black Prince, Iowa, Hudson, Bean Pine, and Victoria; these, when planted in the vicinity of each other, will produce great crops, and continue a month in bearing; good, deep, rich soil is their delight; plant in rows nine inches apart from plant to plant, and eighteen inches from row to row. Take a thin crop of lettuce and radish from the same ground, as the vines will make little progress till September. I must now urge upon the farmer the all-important subject of sowing a large breadth of roots for stock in winter. Plenty of carrots, turnips, and parsnips for our cattle in winter and spring, cannot be overvalued. We finished feeding our common turnips in December; our carrots in January; Swedes in February and March, till now, 20th, we have had just hauled in from ground, a supply of parsnips, which will last till grass is fully up. We do not admit that the milk pail can be filled, or cattle kept in order upon corn fodder or dry hay. There are several kinds of carrots and parsnips; for the former, we prefer the Altringham and white Belgian, and of the latter, the large field sugar parsnip. These yield the greatest weight per *acre.*

AN APPEAL TO THE AGRICULTURISTS OF THE MIDDLE ATLANTIC STATES.

THIS is an eloquent and patriotic appeal, published originally in the National Intelligencer, and since then in the American Farmer, and otherwise widely disseminated; from the pen, we presume, of the chairman of the committee, consisting of CHAUNCEY P. HOLCOMB, of Delaware; A. BOWIE DAVIS, of Maryland; BERNARD PEYTON, of Virginia; FREDERICK WATTS, of Pennsylvania; AARON ROBERTSON, of New Jersey; and J. H. BRADLEY, of the District of Columbia, all "good men and true," appointed, by the *Maryland State Agricultural Society*, at its late anniversary meeting, "to address those of their fellow-citizens connected with agriculture in the States of Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and North Carolinia, on the importance of becoming members of this society, and holding great annual agricultural exhibitions at the city of Baltimore, at which this large central district shall be represented."

To use the emphatic language of the editor of the American Farmer, we "indulge the fond hope, that its adjurations may light up a zeal and interest among the husbandmen in the several commonwealths appealed to, that will show, when yeomen strike for a good and a holy cause, that that cause must prosper." But, be it sorrowfully confessed, our hope is not very sanguine. We have lived too long, and witnessed rather too many paroxysms of this sort, in favour of general improvement of the condition of agriculturists, while the aggregate result has been aggregate deterioration, to have very strong faith now, in the permanent effects of such experiments, we going on all the while importing from abroad, the great staples of our country, embodied in manufactures wrought abroad, out of materials so superabounding among ourselves; and may we not say, especially in Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and North Carolina; wrought, too, by the labour of men who have to choose, on a Sabbath day (the only day they taste either), between a small morsel of meat, or a smaller morsel of butter, "fit only to grease cart wheels."

Judging from the nature of the proposed remedies, it often seems to us, that farmers mistake the nature of their complaint; which is, not deficiency of production, but *deficiency of demand* for what we do, or very well know how to make, when the market is sure, and the price remunerative. Until the government shall take measures to diversify labour, and concentrate population, all increase in the weight of animals, and the measure of crops, must be attended with corresponding diminution in the value of these staples. But once establish on the *assurance of ample remuneration* (its only sure foundation), the *will* to improve, and the *way* to do it, will certainly be found out: it will open of itself, just as naturally as broad daylight succeeds to the morning's dawn.

The question is, when these gentlemen come together from Maryland, and Virginia, and the Old North State, and have the genuine root of the evil exposed, will they grapple with it, and take measures to protect and encourage the growth and manufacture of our own wool, and coal, and timber, and iron? Have they not laid upon the table, in the Maryland Agricultural Society, a simple, tame, humble expression of opinion, that, while Congress is appropriating *their money* for instruction in the use of the cannon and the sword, they might give at least an equal amount for instruction in the use of the plough? Have they not? We ask again—have they not declined to express an opinion on so clear a proposition as that?

As long as farmers are content with *being permitted* to associate, and on that, giving a receipt for all further claims on the care and patronage of government, they will be graciously allowed to form societies—nay more—they may get as many "acts of incorporation" as they will take the trouble to draw up. No! friends of agriculture; what is needed, is *protection to American labour, in every form and department of industry for which we have the elements and resources*: and further—to have a portion of the many millions now given to war, and preparations for war, appropriated to sowing the best of all means of national defence—that is, to *sowing the seeds of knowledge in the minds of the rising generation of farmers.* It is to that you must make up your minds, if you want permanent *improvement and permanent peace.* But we may be wrong. We may have been more than thirty years studying the foundations of agricultural prosperity to no purpose. Yes, *we may have been!*

APATHY CHARACTERISTIC OF AGRICULTURISTS AS A CLASS—PROOFS OF IT.

OPPORTUNITY such as, we may say, without presumption, few have enjoyed, for so long a time—consisting of nearly a third of a century that we have held extensive communion with the *cultivators of the soil*, devoting all the while, our time and faculties with

instinctive anxiety to their welfare—has enabled us to judge, so far as we have capacity to judge correctly, of their habits and character *as a class;* and with shame and regret be it acknowledged, that of all industrial classes, we are forced to regard the agriculturists of the United States as the most inert—the hardest to excite, and the most difficult to keep excited, in matters that *most deeply concern themselves.*

Of this mortifying truth, many proofs might be given, though there needs none more striking, nor to them more derogatory, than the tameness with which they have, during the whole existence of this government, allowed themselves to be fleeced, to the tune altogether of some $600,000,000 for military establishments and the diffusion of military instruction, while they have not had the spirit to demand the establishment of academies and schools in the States, for agricultural purposes, like the military and naval academies and schools maintained at their cost for the purposes of war!

Several times, in years past, we have been at the trouble and expense, individually, of having memorials printed and circulated, to be signed by farmers in Maryland, which only went, very tamely, the length of asking the Legislature to represent to Congress, that when public money *should* be appropriated for military education, at least an equal amount should be applied to agricultural instruction. Well, though these memorials were widely distributed, only one or two would take the trouble even to get them signed and sent in, though all admitted the principle to be right, and then they found their way to some old pigeon hole of a committee room, to be soon covered, along with memorials against sheep killing dogs, with dust and cobwebs; and not a farmer ever asked his delegate what was done in the case! On another occasion, we had the presumption, some years since, humbly to memorialize Congress ourselves on behalf of the agricultural interest, to the same effect. It was presented with a flattering and impressive appeal to the Senate of the United States, by the present distinguished law officer of the government, and after discussion, decided, that it could not properly be referred to any but the *Agricultural Committee*—but that committee, sitting on what may well be called the backbone of our whole system of national industry, held not *one meeting during the Session!* nor has any farmer of the Union ever felt interest enough, or one of the many papers which ought to be regarded as indexes of public opinion, ever thought it worth while to inquire—Why is it, that while Congress is so easily excited about other things and so ready to run into every clap-trap—so ready and even eager to lavish the people's money on everything that smells of powder and of blood--not a dollar is given directly, nor the least regard manifested for *the cause and the interests of the plough!* the great instrument of national prosperity and power! the instrument which supplies the material of every industry—the bread for every mouth? To come back to bodies and spheres of action more limited. In Maryland, in good weather, in a populous and central city, where farmers all have business at any rate, you can get up a "big meeting" once a year, and then, *what a deal of tall talking!* Well! being present at one of these meetings, we thought we would venture quietly to put some balls in motion that we well knew *ought* to be kept rolling until practical results should be achieved; that is, if there was anything solid—anything available—in the show of zeal which becomes apparent and seems every autumn to promise a fruitful harvest. If, in a word, it was not a mere spasmodic effort—one of those lively paroxysms of good intention, that effervesces like sparkling champagne, and as soon goes off in froth. Accordingly, we made a suggestion about remedies against the *curse of sheep-killing dogs*, as the only bar in Maryland, and Virginia, and other southern States, to the prosecution of a branch of husbandry, by which the landholders of Maryland might easily realize a clear revenue of $200,000 a-year, over their present income. "Aye," said every one. It was agreed on all hands—the impression was unanimous—that the subject deserved immediate and serious attention. A committee of inquiry made an able report on the matter. The Legislature was to be memorialized to lay a tax on dogs, and otherwise contribute by legal exactments, to the abatement of a vile, disreputable, and ruinous grievance. Well, the Legislature has had its biennial session, and is not to come together again for two long years. But—*was anything done?* A most respectable committee, even the President of the State Agricultural Society, a host in himself, was appointed to urge that and other measures; but, we ask again, *was anything done?* No! And will any member ever be called on to answer for his delinquency? No! For well they knew, that their constituents would never make them amenable for any neglect, unless it should be neglect of the *interests of the party to which they belong!* unless it should be for some oversight, some want of sharpness and tact in looking out for the *interests of the party!!* Party! party! party! power! power! power! spoils! spoils! spoils! The question is, not whether a legislator has talents to comprehend and manliness to go first of all things for the true interests of agriculture; but whether he has sagacity to contrive or quick discernment to discover and avoid a political clap-trap! and thus each party dreads to approach an acknowledged and enormous evil to which we have referred, for fear of *a cat in the meal tub!*

Well, we shall now turn to another proof, as if proof were wanting, of the truth of the position with which we set out, that of all classes that go to make up this busy and fleeting world of people, the *tillers of the soil are the hardest to be moved and kept alive as to what peculiarly and vitally concerns themselves.* But, reader, do not suppose we have any pleasure in the task. For us it is full of mortification, and would be esteemed worse than superfluous, if we did not design at last to attempt to look into the cause of the malady and the cure for it. That will be done, then, before the subject is finally relinquished. In the mean time let us turn to another proof of lamentable supineness characteristic of the class for whose welfare we have been exerting our best faculties all our life.

AVERAGE ACREABLE PRODUCE OF MARYLAND.

We had seen in the Patent Office Report for 1848, an estimate of the average acreable produce of great staple crops, founded on the best information the commissioners could obtain, and doubtless with an earnest desire to approach the truth as near as possible.

Looking at Maryland in that estimate the average is put down, *wheat at* 6 *bushels to the acre; oats*, 10; *rye*, 5; potatoes, 100; and as to *Indian corn*—as another evidence of the sensibility and aptitude of farmers to heed every attempt to illustrate and improve their condition—the commissioner seems not to have been able to procure *any returns whatever from Maryland*, on which he could base an estimate. Well;—being perfectly satisfied that if such were the average products per acre, in the three grains mentioned, the average tendency of all engaged in their culture in our old native State must be to rapid ruin, so far as these crops enter into their means of living; we thought we would make a more particular attempt to come at the real state of the case in each county; and took measures accordingly, such as one might suppose could not possibly fail where there was the *smallest spark of public spirit* among the farming community, in regard to the concern which constitutes the sole business of their lives, except *party;* and this is the plan we adopted. A *table* was formed, and several hundred *printed*, which left the respondent nothing under heaven to do, but to take his pen or pencil, and, as he sat at his table, fill up with *figures* his rough estimate or supposition of the *probable average* yield per acre in *bushels* of *wheat*, *rye*, *oats*, *barley*, *buckwheat*, *field peas*, and *turnips*, *potatoes*, and *indian corn*, in *pounds* of *hay* and *tobacco;* and the average *quarts* of milk through the season; with his opinion of the *average* time of each cow at the pail in the year; so that an estimate might be formed from these two facts, what is the probable average yield per year, of cows, in milk or butter, in the several counties of Maryland.

Well, we knew that there was no barley of any account; not much buckwheat, and but few field-peas, or potatoes, or turnips, raised as *field crops.* It was not in ignorance of these facts that they were embraced in the tables, but we wanted to have the facts of their constituting little or none of the resources of Maryland husbandry, to be *thus established;* leaving open the consideration, whether they might, or not, be profitably introduced. Many other subjects might have been well included, such as sheep, wool, sheep killed by dogs, &c. But we too well knew who we had to deal with; men generally as unsurpassed in intelligence as they are in *vis inertiæ.* We therefore desired to confine the inquiry to a very *few leading objects*, and to make the table as simple as possible, requiring not one word to be *written*, but the ready ruled columns merely to be filled in with figures, after five minutes' reflection, with pen or pencil, as the farmer might be sitting where he would open the letter.

Along with these tables, on the same sheet, was the following printed letter in the way of persuasion and reconcilement to take even that little trouble for public enlightenment, as to the real condition of the agriculture of Maryland in relation to the primary crops to which they look for all that they work for, and live upon.

Washington, D. C., ———, 1850.

Dear Sir—This application is made to you, respectfully, in the persuasion that the interest you are known to take in all that concerns agriculture, will prompt you to fill up the blanks and return it to me, under cover to your Representative at Washington.

I am aware that your estimate must necessarily be a conjectural one; but I know as well, that it will be impartial and candid. From it and others, from all parts of the State, a general one may be formed, as reliable as can be had except by public means and authority—of the average acreable products, &c. of the State.

I need hardly assure you, that the general results to be thus obtained, are intended only for better information as to the real condition of your agriculture. Please mail your answer within a week, and let it be addressed to

Yours very respectfully,

J. S. SKINNER,

Editor of "The Plough, the Loom, and the Anvil," now at Washington.

To ————

To the accomplishment of the object in view it was obviously proper to address these appeals, to some prominent individual in each election district, in each county, distinguished, or supposed to be in advance among his neighbours, not in zeal alone, or judgment alone, but for such a combination of public spirit and intelligence as would warrant the hope that he would at least take the trouble, which he could do in ten minutes as well as in seven years, *to fill up these blanks with his "conjectural estimate," refold the letter and send it by first conveyance to the post office.* Care was taken to have it so conveyed to each, that not even five cents postage should accrue on it.

The next thing was to *find the men*—clever, civil, intelligent, public spirited friends of the cause—even one in an election district—cordially despising the thought of inquiring or caring to what *party* he might belong! Happily, the State Society was in session in Baltimore. All was animation; every one was boiling over with zeal in the good cause; the plan of coming at the truth was approved and deemed as infallible as any plan could be. Such estimates periodically would tell whether the State was moving ahead or falling astern. The members of the State Society then present gave the names of persons *they were sure* would gladly respond in their respective counties. Oh yes, not a doubt of it. Some of them consented to have their own names put on the list; and these letters, with their blank forms attached, were accordingly forwarded to some prominent and active friend of the cause, or supposed to be such, in *every election district in Maryland*—not less, we suppose, than one hundred at least.

Now then, what does the reader suppose was the result of this well meant and to us laborious and expensive attempt to come at the real condition of Maryland agriculture, the products of its labour, and the yield of its capital embarked in the cultivation of the soil? Why, instead of a return, as might have been expected, from each election district in each county, from which to strike the average for the county, up to this time we have from Washington county three returns, from Somerset one, Carroll one, St. Mary's one, Frederick *seven*, Alleghany three, Cecil two, Talbot one, Worcester two, Montgomery one, Prince George's two, Baltimore county two, Anne Arundel, Charles, Caroline, Dorset, Queen Anne's, Kent, and Calvert ———!

In our next we shall add such as may then, if any, have been received, with some view of the result, partial as are the means. In the mean time we note that the first return received was from that thoughtful and enlightened friend of the cause, Mr. W. W. W. Bowie, of Prince George's.

ON THE PREPARATION OF HEMP AND FLAX FOR MANUFACTURE.

Not knowing which, if either, of the following letters from Mr. Anderson, was intended to be reserved, we think it best to publish both. The subject is one of deep interest. The capabilities of the country for producing these articles are so extensive and rich, and the commodities themselves are of so much national importance—especially hemp, in its relation to our maritime interests, that we shall not let it go, until we have come to the bottom of it: to see how it is, that we should be sending abroad for sail cloth as well as other cloth—and iron. For ourselves we are satisfied, as we have before said, that if it could be examined without prejudice—if we were to consult and follow the true interests of the United States, in regard to our supplies of sail cloth and iron, we would look to our own means and resources; instead of looking for advice to Sir Henry Lytton Bulwer, her Britannic Majesty's minister at Washington, or to Mr. Brown, "of Richmond Hill, near Liverpool," M. P., who has amassed his millions by his profits as an exchanger, between the American producer and the English manufacturer, in pursuance of the policy which he recommends in his letter to Mr. Meredith, and which we have continued to follow, with little intermission, from the days of our Colonial dependence to the present hour, being still as then, as General Jackson said—"subject to the policy of British merchants."

In a letter from a manufacturer of sail duck, a political friend of the late administration, he says, under date of the 22d ult.

"The poor domestic men are utterly irrevocably ruined by Mr. Walker's tariff, and after thirty years I am endeavouring to save from the wreck enough to subsist on during

the remainder of my life. My children I have taught to adventure nothing which the legislation of county court lawyers can affect. It is of no use to write or talk about hemp or flax, unless you can create consumers. The [American] manufacture being destroyed, it is of no use to have growers."

Louisville, 11th March, 1850.

JNO. S. SKINNER, Esq.

DEAR SIR:—I acknowledge receipt of your letter 2d March, and regret that I cannot give you in this communication such a description of the new hemp brake, as would render it intelligible to the readers of "The Plough, Loom, and Anvil." Let it suffice for the present, in saying, that the main machine has been in operation and comes up to my expectations. I have had, and have seen many hemp machines, in operation, but without any good results. My present machine embraces every principle of the hand brake, and performs, by the peculiar arrangement of its several actions, every motion of the operator on the hand brake. I am now making some changes in the machine, with a view of cheapening it, that every farmer disposed to produce a better quality of hemp than any heretofore in market, may avail himself of its use. There is no doubt but that hemp, as hitherto prepared, had commenced its decomposition previous to its manufacture into cordage, hence its rapid decay when exposed to a warm and moist atmosphere. With the aid of the new machine, I can prepare hemp for market with half the exposure, to either water or the atmosphere, that has been heretofore observed.

I could give you a full description of the process for the preparation of hemp for naval purposes, but as I am just on the point of departure for St. Louis, I must delay it to a more suitable moment.

You can see in the Patent Office a working model of my new machine. You would oblige me by calling and examining it. It answers as well for flax as hemp, and acts better on hemp and flax half rotted, than it does on dew rotted or over rotted hemp.

Yours, very respectfully,
JAMES ANDERSON.

Louisville, 11th March, 1850.

I have a few moments to spare, and will occupy them in giving you a rough and rapid description of the only process, in my opinion, for the preparation of hemp and flax, for naval purposes.

To give durability and strength to hemp and flax, it is absolutely necessary to avoid fermentation; that fermentation will take place, from undue steeping in water, is manifest, from the bad odour arising from every vat or pool in which hemp or flax is cured, and must be avoided. Every chemist is now compelled to acknowledge that fermentation is the beginning of decay, and surely the government do not want an article, on which so much is dependent, that has commenced decaying previous to its being brought into use, especially when it is known that decaying vegetable matter has the process hastened by exposure to heat and moisture.

It has heretofore been necessary to over-rot hemp to enable the operator to brake and clean on the hand brake; hence the necessity of a machine that will operate for the removal of the wood before the harl, or, if you please, the fibre, has been impaired. My machine will do that and do it better than if the article had been over-rotted; this has been exemplified in every experiment, and can be easily explained to an experienced hemp or flax grower.

For the purpose of coagulating the albumen (which exists in all vegetable matter, and in large quantities in hemp), and to render it insoluble, it is necessary to carry it through a heating process that will not generate fermentation—that can be effected by inundating the hemp in a tight vat and allowing the water to remain until every strand of the hemp is saturated, say for a period of twelve hours, then withdraw the water and let the hemp remain in the vat until the natural heat (which will surely generate), has so far penetrated as to cause the cuticle to slough off; it is then ready for a second inundation, and may so remain for months without fear of fermentation or decay—surely if it will not decay in the vat it will not do so readily in cordage—the article so produced presents an oily appearance, and differs from any hemp I have ever seen. Hemp thus prepared cannot be cleaned by the hand brake, but is operated on by my machine, with great facility. Flax so prepared would be as strong as silk.

In haste, yours truly,
JAMES ANDERSON.

FLAX A RESTORATIVE, NOT AN EXHAUSTING CROP.

[AUTHORITY: PROFESSOR KANE.]

From Dixon's Letters on Flax Husbandry.

As there are many tales told, calculated to prejudice land-owners as well as farmers, and prevent experiments in flax-culture being made, I wish now to call attention to observations and experiments, in order to disabuse (if possible) the minds of those farmers who labour under the delusion (handed down to them by their grandfathers) that flax not only exhausts the soil, but is ruinous to the producer; and, as I think, the evidence I now bring forward will be sufficient to satisfy the farmers and prove the absurdity of such threadbare tales, I must address myself to those landlords who prohibit (by the terms of the leases granted) the cultivation of flax. Surely, they are more open to conviction than to continue to believe *mere assertions* in preference to FACTS PROVED BY EXPERIMENTS, and corroborated by the LEARNED PROFESSIONAL MEN, whose lectures on agricultural subjects have earned for them *the thanks* of so many noblemen and farmers' clubs in the three kingdoms. I cannot believe that there is a land-owner in England so contracted in his ideas as to take advantage of such restrictions being (through downright ignorance of the nature or value of the plant) in leases against its cultivation. If they consider it a more scourging crop than wheat (and that *I deny it to be*), have we not now skilful chemists able to direct us to restore to the soil, by the many now available manures, those ingredients of which flax may be found to have robbed it? And would not the oil-cake, or, what is better, the *crushed seed*, not only be highly beneficial in the *feeding of animals*, but is it not acknowledged BY ALL that there is nothing equal to it as *an enricher of the farm-yard manure?* With these facts before the eyes of the opponents of flax, I shall proceed and call their attention to further evidence on the subject.

As I cannot expect farmers to give the subject of which I am the humble advocate, the consideration that they would do, if the same was placed before them by a *man of more influence*, I must, therefore, endeavour to support my argument by the observations of men whose efforts in agricultural improvement have done much to advance and connect science with the agriculture of Great Britain. I have already used the names of flax-spinners; and, in order to corroborate my statements, I shall now add that of another, Mr. Crosthwaite, of Dublin, who stands in Ireland, as Messrs. Marshall and Co. do in England—*at the head* of the flax spinning trade, and I must couple with this gentleman the name of a professor whose works are acknowledged to be of *national importance.* The following is a quotation from Dr. Kane's writings:

"Mr. Crosthwaite, whose intimate acquaintance with all branches of this industry renders his authority highly valuable, considers that there are about 100,000 acres under flax in Ireland, and that the produce is about 30,000 tons, of an average value of 50*l.* per ton. This is 6*s.* 3*d.* per stone, and should give about 12*l.* 10*s.* [$62 50] for the usual produce of the statute acre." "The flax, when it has grown to a suitable maturity, according as the design is to allow it to ripen its seed or not, is pulled, and either immediately, or in the next spare season, according to the circumstances of the locality, it is subjected to the process of rotting or watering. In the stem of the flax there may be recognized three structures—the outer skin or epidermis, covering a close network of fibres which encloses the plant as in a sheath, and in the centre a stem of dense, pithy material. The fibrous network is connected together by a glutinous matter which must be decomposed before the fibres can be separated from the stem, and it is to soften and rot this substance that the plant is steeped. If the steeping be continued too long, the fibre itself may rot, and be weakened and injured in quality; if the steeping be not continued long enough, the fibres are not thoroughly separated from each other, and the quality of the flax is coarser than it might be." "When the flax is steeped, the water acquires a darker colour, a disagreeable odour, and, it is well known, becomes poisonous to fish. This arises from the solution of the glutinous material which had cemented together the pure fibres." "The author of the 'Survey of Somersetshire' (Mr. Billingsby) says: 'Having myself cultivated flax on a large scale, and having observed the almost instantaneous effect of flax-water upon fish, similar to that produced by lime, I was led, some years ago, to apply it to some pasture land, by means of watering-carts similar to those used near London for watering the roads; the effect was astonishing, and advanced the land in value 10*s.* per acre.'"

This extract shows that Professor Kane has conversed with flax-spinners, and has been made acquainted with the details of flax-culture. The following passage on the same subject is taken from the "Scottish Farmer;" and, as the writer of the article is already partly convinced against his will, I hope fully to convince him that flax is not an exhauster of the soil:

"The landlords of Scotland have hitherto been opposed to the growth of flax, in

consequence of its being a 'scourging' crop; and, in the majority of leases, a clause is introduced prohibiting or restricting its growth. Professor Low says (and all our agricultural authorities agree with him), that flax is an exhauster of the soil and farm, and more so, when its seeds are permitted to arrive at maturity. When pulled green, its effects are less injurious; in which respect it follows the general law of other cultivated plants. But still, at whatever period reaped, it is thus far an impoverisher of the farm, that its stems yield no return in manure, and that its seeds only do so when consumed upon the farm. In a paper read by Dr. Kane before the Royal Irish Academy, that gentleman attempts to prove, that in the production of the fibre no exhaustion of the soil takes place, that substance being exclusively composed of organic matters derived from water and the atmosphere. He says, 'in this respect, the fibre differs from the woody stem which it surrounds; as the latter, by combustion, yields a considerable quantity of ash, consisting of inorganic compounds derived from the soil; but then, the woody part of the plant is not removed off the farm, it being of exceedingly little value; and, however the cultivation of the crop may exhaust the particular part of the farm on which it was grown, by the matters contained in this woody fibre, it is apparent that the farm itself will not thereby be exhausted, as these matters are returned to some other portion of it, in conjunction, perhaps, with the manure of the farm-yard. The proportion of inorganic matters contained in the seeds is very small compared with its entire bulk, so that the consumption of the seed on the farm not only makes the flax a non-exhausting crop, but absolutely a restorative one.' "

Dr. Kane is supported in his theories by the Report of the Belfast Society, which says: "The principal objection urged against the extended growth of flax is, that it exhausts the soil without returning anything to it. But, by saving the seed and seed-bolls, and feeding upon them, the manure thus produced can be returned to the ground, and will supply most of the valuable constituents abstracted from it during the growth of the plant. The flax-shaws from the mill, and the putrescent water from the flax-pools, should be fermented together and returned to the soil. The land would thus have replaced on it almost every particle of matter formerly abstracted by the crop; as it has been ascertained, beyond a doubt, by chemical analysis, that the fibre for which the flax-plant is cultivated, is produced entirely from the atmosphere."

If we consider the quantity of seed for consumption on the land given by the flax-crop, we may well call it a manure-producing crop, rather than an exhauster of the soil. At the monthly meeting of the Belfast Flax Society, held on the 16th July, the following letter, which had been sent by one of its members, was read by the Secretary:

"I am happy to be able to bear my testimony to the fact, that if flax be judiciously grown, and well handled, there is *no other crop that will pay like it.* I had, last season, not quite eight Irish acres of flax, from which I had 295 stones, which brought 8*s.* per stone in Cooks-town market, and 31 stones at 6*s.*, besides 4½ cwt. of scutching tow, at 9*s.* per cwt:

295	stones, at 8*s.*	£118	0	0
31	stones, at 6*s.*	9	6	0
4½	cwt. tow, at 9*s.*	2	0	6
		£129	6	6

being upwards of 16*l.* per acre: besides this, I had an exceedingly large quantity of bolls, which fed my cattle to the greatest advantage during *the whole season*, and as much seed saved on the Courtray system, as sowed about three acres this year."

The seed in the bolls, if it amounted to an average Norfolk crop, would be equal at least to 319 bushels, so that I may add to the	£129	6	6
The value of 319 bushels of seed, at 6*s.* 3*d.* per bushel	99	13	9
	£229	0	3

And eleven English acres, if it cost 100*l.* to bring it to market, would have 129*l.* profit, on what I call a very middling or very light crop of flax, viz., thirty stones per acre.

Now, with all deference to Professor Low, I must believe experiments before his assertions; and, I believe that flax has never got a fair trial in Scotland, to enable him to tell us how much more it exhausts the soil than a crop of wheat, or to answer this question—How much manure will it take to bring the ground into the same condition after growing flax, that it would be in if it had been sown with wheat? It is only in this way we can come to anything like a correct idea of the subject; and, as I have said before, I have had as abundant a crop of oats, and also clover, after flax, as ever I had after wheat or barley. I challenge the opponents of flax to answer this question; and then we can calculate the expenses of restoration, and the means we have of doing it, by growing flax; for, according to every calculation I have seen, showing the expense

and the profit on wheat, or any other crop, there is none to be compared with *even a middling crop of flax*, as the most remunerating crop for the farmer. And as I am not confined to the quotation of *one, two, or three experiments*, in order to prove the fact, I shall give another instance of what may be made by its cultivation.

The Rev. G. Ash, Glebe Ballaghy, Ireland, in writing to the Secretary of the Belfast Flax Society, to tell him of the success of his first experiment, says:—

"I sowed fifty-three pecks of seed on three acres and three roods of ground, Irish measure, and I have had 236 stones of 16 lbs., or in Armagh-market stones 266½. I have two sacks grown from the same seed saved for my own sowing, and I have two tons of linseed meal, which saves me purchasing bran, etc. etc."

Here is the first experiment. 'A gentleman unacquainted with flax-growing, sows 13¼ bushels of seed on about five acres English, and has 266½ stone, or 53¼ stone to the acre, *two sacks of seed, and two tons of meal;* now, as the seed, it is well known, if properly saved, will pay RENT and ALL EXPENSES, we must reckon Mr. Ash had for his trouble profit as follows:—

266½ stones of flax, say 8*s.* per stone, 106*l.* 8*s.*

Added to this proof of the benefits derivable, I shall quote one more on its advantages, which I have taken from the *Agricultural Gazette*:—

"EFFECT OF OIL-CAKE ON THE MANURE OF THE ANIMALS FED ON IT.—A friend of mine has lately adopted a plan, which, under the same circumstances, I should strongly recommend; it is that of giving a small quantity of oil-cake to animals grazing, for the sake of improving an ordinary pasture; and its effects are astonishing. The pastures I allude to are small; and one or two bullocks more than they are calculated to carry are put into each: the lot are then allowed four pounds of cake per day per head; this, at a cost of about 2*s.* per head per week—which I believe the stock well paid for—has entirely altered the face of the pastures from what they were three years ago, when the plan was first adopted by him, and, I believe, without any loss to himself."—*G. Dobito, English Agricultural Society's Journal.*

I could, if necessary, multiply evidence; however, as I consider I have now placed undeniable facts before you, I will conclude my remarks, by a quotation from a letter from James M'Adam, Esq., Secretary to the Belfast Society, on the 18th December last. He says: "As a proof of the great demand for flax at present, I may mention that, from this port, orders are now out for 300 tons of flax from Egypt, and for 2000 to 3000 tons, value 70,000*l.* to 100,000*l.*, from the Baltic; and this, in spite of the largest home-grown crop for several years. There have been lately erected in this neighbourhood 60,000 additional spindles, which will be at *full work* during the ensuing year, and which, it is calculated, will consume 3000 tons additional of flax yearly."

If this be not proof sufficient to satisfy farmers and land-owners of the importance of flax-cultivation, I can only say that they require such men as the learned Professor Kane to go amongst them. I am, sir, yours respectfully,

J. H. DICKSON.

6, *De Beauvoir Square, London.*

LINSEED JELLY—as food for stock—how made:

"The following is an analysis of linseed, by Mr. Gyde, of Painswick—a comparison of it with those of linseed cake, by the same gentleman, exhibits the superiority, as food, of the seed entire, over its husk, etc., after the oil has been expressed.

Water.	Gluten, Albumen, and Casein.	Starch, Gum, Sugar, and Woody Fibre.	Fat.	Ash.
10	22.8	27.2	36	4

"But the superiority of this article as food does not depend only on the assertions of scientific men who have investigated its composition: it has been *experienced.* Mr. Warnes, of Trimingham, well known as a hearty advocate of flax culture, was, we believe, the first to point out the advantage of using linseed-meal, made into a sort of porridge with bean and barley-meal, as food for cattle. His recommendations have been extensively acted upon. The following, with which we have been favoured, describes the practice of one of our best Norfolk farmers: 'One bushel of linseed is ground between two smooth cylinders, and boiled slowly in a copper for one hour with thirty gallons of water, keeping the mixture constantly stirred to prevent burning. To every gallon of jelly thus produced, one bushel of cut straw is added, and the whole being mixed in a large tub is kept covered for four or five hours, after which it will be fit for use. I consider this the cheapest and best food for cattle that we can make; but if barley, bean, or pea-meal be thought necessary, the cattle will eat it better given to them in a dry state at the same time with the above preparation.' One of the most valuable pieces of evidence, however, on this subject that we have seen, occurs in Bacon's

'Report on the Agriculture of Norfolk,' where the experience of Mr. Postle, of Smallburgh, is given in detail.*

ON THE PROFITS AND QUANTITY OF FLAX PRODUCED PER ACRE.

To the Editor of the Gardener's Chronicle and Agricultural Gazette.

SIR—Press of business has prevented me, until this moment, from noticing your observations on my letter on the cultivation of flax, which you thought proper to *divide*, and insert in your paper of the 11th and 18th of January last. And I feel I have much cause to complain of the nature of your remarks, made, as they were, before the readers of your paper had an opportunity of seeing the whole of my letter, *without omissions*, which I also complain of. However, my object is now to place before the readers of your paper, what will convince practical men, that my statements are supported by facts, and that I have not had recourse to *theoretical observations* to prove them.

The impression conveyed to the readers of your paper, that I wished to make it appear that the owners of 112,200 acres in Ireland had each 21*l.* per acre profit, is *very unjust;* and as it has called forth a letter from Mr. John Sproule, who joins you in trying to make the readers of your paper believe "my statements" "are erroneous," I am anxious to say that I am prepared to meet the charge, and not only set myself right in the eyes of those who read your paper, *and have been misled*, but also to show that Mr. Sproule, if *ever he grew flax*, or *has seen flax growing*, should endeavour to keep pace with the times, and not continue to tread in the footsteps of his father and grandfather; and as his system of flax growing could only produce "40 *stone to the acre*," and realize 4*l.* 10*s.* *for the seed*, I would advise him, instead of commenting on letters sent to the *Gardener's Chronicle, previous to publication*, to spend a few weeks in Farningham, Norfolk, with Mr. Warnes, Mr. Farrow (secretary to the Ipswich Flax Society), and others in that quarter, men of the present day, unfettered by prejudice in favour of *the no-improvement*, and *let well-alone* system. Mr. Negus, of Cumplisham, Norfolk, and the Rev. J. C. B. Warren, of Horksley Hall, can teach him how to grow flax to produce from fifty to seventy stone to the acre, and twenty-nine to thirty two bushels of seed *into the bargain*, which seed is equal to the best Dutch, and better than Riga, which sold at 12*s.* 6*d.* last spring in Ireland; or, if perchance Mr. Sproule should visit Ireland, I would recommend him to call on the Rev. G. H. Ash, Glebe, Bellahy, and, in particular, on Messrs. Herdman and Co., flax-spinners, Strabane; and, as a proof of their ability to enlighten his understanding, not only on the *growing of the plant, but the management when grown*, I shall give a statement taken from the Reports of the Belfast Flax Society on the 14th ult.

Mr. Ash, in writing to the Secretary of the Society, to tell him of the success of his first experiment, says: "I sowed fifty-three pecks of seed on three acres three roods of ground, *Irish measure*, and I have had 236 stone of 16 lb., or in Armagh Market stones, 266½. I have two sacks grown from the same seed saved for my own sowing, and I have *two tons of linseed meal*, which saves me purchasing bran," &c.

Now, how will Mr. Sproule reconcile this with his observations and statement of 4*l.* 10*s.* for seed, and 40 stone to the acre, being "over the mark?" Here is the first experiment: a gentleman, unacquainted with flax-growing, sows 13¼ bushels on about 5 acres English, or 3 acres 3 roods Irish measure, and has 266½ stone, or 53¼ stone to the acre, 2 sacks of seed, and 2 *tons of meal.* However, this is not all: I have a little more for Mr. S., in order that he may know that all is not done *in growing the plant.*

Mr. Henderson stated at the meeting, that a farmer near Strabane sold Messrs. Herdman and Co. a field of flax, keeping a portion to himself, which he managed in *his usual way*, and sold the produce at 35*l.* per ton; but Messrs. H. and Co. having managed what they had from the same field, *on the improved method*, had flax worth 70*l. per ton.* Here is a puzzle that some may say "requires serious consideration." However, I feel satisfied that practical men will see no difficulty in the way of their (doing like Mr. Ash) trying experiments, nor will they be frightened by parties attempting to make *molehills* into *mountains* by saying "that the growing of flax in this country requires more serious consideration" than any other seed we commit to the soil.

You will observe by the written addition now sent to my letter formerly published, that I have given the names of practical gentlemen who can corroborate my statements, on *expense*, *produce*, and *profit;* and, as I never said, or intended to convey to the readers of your paper, that every man who grew flax on the 112,200 acres had 21*l.* or 50*l.* per acre profit (as, unfortunately for Ireland, there are too many like Mr. Sproule, ignorant of the proper way to acquire more than 10*l.* to 15*l.* per acre), on the contrary, I only wished to prove *what had been done*, and *what might be done*, by following the Belgian

* That valuable prize Report being in our library, we will turn to it on some early occasion.

mode of cultivation, rotation, and management of the plant; therefore, I hope you will do me the justice to publish this letter, and also insert *the whole of the one now sent*, instead of omitting some of the best and strongest arguments I have in favour of flax-growing in this country.

Mr. Sproule says, "From the prices I quote, flax is either a highly valuable or ruinous crop." I think the absurdity of this remark will be seen by his own calculation: for, as he chooses to say, 40 stone of flax per acre is *an average crop*, and shows by his statement, that a profit of 15*l.* 5*s.* 3*d.* per acre is certain, I think farmers, who know right well the profit on an acre of wheat, oats, or barley, can *too well* tell *the ruin that they would have to fear*, from 15*l.* 5*s.* 3*d.* per acre profit by sowing flax; and, as he affects to consider "my papers afford unquestionable evidence of my not being practically acquainted with the subject," I beg to observe, he has with this my address, and if he has *no objection* to furnish me or the public with his, I will tell him where to find *every field, of four farms I had*, in the counties of Down and Armagh, Ireland, on which my father and myself reared flax, that brought, in the city of Dublin market, 22*s.* 9*d.* per stone; and, on one farm, I reared flax, in 1826 and 1827, for which I only got 10*s.* 6*d.* per stone, and on that farm I had a scutch mill.

Mr. Sproule admits his "ignorance of this country, and his inability to say what sum should be assumed for rent," but hesitates not to find me in error *in this also*. Before I wrote a letter on the subject, I selected from a table I have, which shows the average price of land in forty counties in England and Wales; and, out of those, I selected *three to name*, Leicester 26*s.* 9*d.*, Worcester 26*s.* 2*d.*, and Somerset 25*s.* 10*d.* per acre, and I allowed the highest of the whole to be my guide; therefore, I think, with such proof before him, he has no excuse, *because of his ignorance*, to assume *his being right*, and *I wrong*, in this item: and as to his remarks on what he is pleased to term "the unpardonable omission of the seed," I beg to observe, there was so little of it saved during my residence in Ireland, the farmers being then nearly all of the old school, and prejudiced against taking it off the flax stalks, fancying it injured the fibre, I allowed the little benefit derived from what might be saved in seed, against such extras as poor rates, cess, and other small taxes, *unnoticed in my statement*—my object being then to prove that flax was profitable to cultivate for the fibre alone. However, as this has been questioned by Mr. Sproule, and may be considered doubtful by those who have compared his statements with mine, I shall now take advantage of his observations, and inform those who have seen the amount (4*l.* 10*s.*) which he allows for seed on one acre, that the Norfolk growers had last year from 9*l.* to 10*l.* worth on an acre.

I beg to hand, with this letter, a Report from the Ipswich Flax Improvement Society, and a letter taken from the Belfast *Northern Whig*, which was written by Mr. Warnes, and dated Trimingham, Jan. 15, 1845, addressed to E. Bullen, Esq., Secretary to the Royal Agricultural Society of Ireland; those documents will prove the ignorance of Mr. Sproule's ideas on flax and seed (without any reference whatever to my letters), as to the quantity of *both* that can be grown in this country on one acre; and I beg of those gentlemen, landed proprietors, and farmers, who may have read your remarks, and Mr. Sproule's letter in your paper of the 11th and 18th Jan., to compare the proof I now bring forward in corroboration of my statements, and judge for themselves.

J. H. DICKSON.

London, March 15, 1845.

ON THE ADVANTAGES OF THICK SOWING.

How numerous yet are the mooted points in agriculture! One reason is, that results depend on so *many circumstances*, which even the most careful experimenter is apt to lose sight of.

Advantage of Thick Sowing.—The following is the result of some experiments which I made last year, in order to ascertain the relative merits of thin and thick sowing wheat, drilling, dibbling, and by broadcast. They were conducted with great care upon five acres of level land of uniform quality, being a good deep loam on a chalk subsoil, following a clover ley folded by sheep. The land was ploughed about five inches deep, as it was not thought desirable to bury the sheep-dressing below that depth. The seed was put into the ground about the 7th December, 1843, and the wheat was hoed in the spring of 1844, except the acre sown by broadcast, which was harrowed instead of being hoed. The plants in Nos. 2 and 3 (thin sowings) were by much the strongest, and looked the best throughout the season, until the approach of harvest, when it became evident that the quality of the grain and straw was inferior, more particularly on No. 2, which appeared to have suffered a little from mildew. Samples of the different lots were submitted to an eminent miller, and the value of each determined by him; the straw was valued at the market price. The results of these experiments are very re-

markably in favour of thick sowing, and particularly of the old broadcast system; and if not conclusive against the doctrine of thin sowing, so strongly and, I may add, so ably advocated in this present day, should at least induce caution on the part of farmers before they depart from the practice of their forefathers. Indeed, it is difficult to believe that so great an advantage as the saving of a bushel or a bushel and a half of seed per acre can have been overlooked for so many generations. It seems more reasonable to suppose, that long practical experience has taught the farmer the more prudent course of a liberal supply of seed. It may, however, be contended, that had the ploughing been deeper and the seed put earlier into the ground, the result would have been different: this is not improbable, and it is possible the deficiences in the quality and quantity of thin-sown wheat and straw might have been less observable; but the large differences which my experiment indicates, could hardly, I think, have been made up. I have, this year, repeated the trial of thin-sowing, having drilled one acre on the 26th of October last (the land having been deeply ploughed) with one bushel of seed, the rest of the field having two bushels per acre. The result I shall be happy to communicate, if desired.

As Mr. Dixon proves by his statement, that the profit by growing one acre of wheat is but 7*l.* 2*s.*, and as Mr. Barclay shows, by FIVE *different ways of trial*, that 40 bushels per acre *is the most he could grow*, which, at 6*s.* per bushel, would be £12 0 0
We must deduct expense of seed, ploughing, and labour, say . . 2 10 0

Therefore the balance of £9 10 0

appears all that can be realized by growing ONE ACRE OF WHEAT in England. Now, if the reader will turn to page 31, and Letter No. IX., he will find one experiment of clear profit of 16*l.* per acre, and he will find another experiment in the same letter, of 21*l.* per acre, *not including the seed*, which, it is well known, *will pay all expenses*, and at Letter No. V. another experiment of 13*l.* per acre. It is because of *these facts*, I insist there is no crop equal to flax for the farmer.—*Dixon on Flax.*

Account of Experiments on the Relative Merits of Thin and Thick Sowing, Drilling, Dibbling, and Broadcast, conducted on Eastwick Farm, in the county of Surrey.

No.	Quantity of Seed used per Imp. acre.	System pursued.	Grain produced.	Weight per bushel.	Straw produced.	Value of Grain.	Value of Straw.	Total Value of the Produce per Acre.
			Bushels.	lbs.	Trusses.		Per load.	£ s. d.
1	2½ Bushels.	Drilled 9 inches apart.	Head 34 Tail 3 37	64¾	70	Head at 7*s.* per bushel . . £ 11 18 0 Tail at 6*s.* . . 0 18 0 £12 16 0	At 36*s.* 3*l.* 10*s.*	Grain 12 16 0 Straw 3 10 0 16 6 0
2	1 Bushel.	Drilled 12 inches apart.	Head 22 Tail 3 25	62½	51	Head at 6*s.* 6*d.* per bush. Tail at 5*s.* 6*d.* 7*l.* 19*s.* 6*d.*	At 30*s.*	Grain 7 19 6 Straw 2 2 6 10 2 0
3	1 Bushel.	Dibbled 12 inches apart.	Head 28 Tail 3 31	63¾	63	Head at 6*s.* 9*d.* per bush. Tail at 5*s.* 9*d.* "	At 33*s.*	Grain 10 6 3 Straw 2 17 9 13 4 0
4	1 Bushel and 3 pecks.	Dibbled 9 inches apart.	Head 34 Tail 3 37	64	72	Head at 6*s.* 9*d.* per bush. Tail at 5*s.* 9*d.* "	At 33*s.*	Grain 12 6 9 Straw 3 6 0 15 12 9
5	2½ Bushels.	Sown broadcast.	Head 37 Tail 3 40	65	84	Head at 7*s.* per bushel. Tail at 6*s.* "	At 36*s.*	Grain 13 17 0 Straw 4 4 0 18 1 0

D. Barclay, M. P., Royal Agricultural Society's Journal.

In giving to this subject more space and attention than some may conceive to be proper, we are influenced, not so much by reference to the actual amount of the crop, and the capital embarked in its culture at this time, as we are by the capabilities of the country for producing it; and by its intrinsic value as an element of agricultural wealth, if properly favoured by wise legislation, and by more familiar and extensive knowledge

of the most approved cultivation and management. But its production even now, perhaps, exceeds the common impression. In 1845 there were near 50,000 acres in cultivation in *flax* in the State of New York alone; and in Ohio, says the Cultivator of Sept., '48:—

"A highly respectable and intelligent gentleman, residing within forty miles of Cincinnati, stated a few weeks since that 100,000 bushels of flax-seed were raised last season in his county; and that nine-tenths of the stalk was thrown away, the seed being got out by threshing-machines, or the tramping of horses, either of which modes of course destroys the fibre. This seed produced the growers about $65,000, and had the lint been saved, properly prepared, and sent to Liverpool, or even New York, an additional product, to the value of at least $150,000 above all cost, would have been the result; and this is only one out of some twenty counties in this State where flax is extensively grown."

Those of our readers who are now, or who may be so situated as to become interested, in the culture of *hemp* and *flax*, by the adaptation of their soil to the growth of these articles, may confidently expect to find the best information extant on the subject, as fast as we can appropriate to it the requisite space, compatibly with that variety which must be furnished by a journal demanded by new subscribers *every month*, from never less than twenty different States, and spreading over them all with remarkable equality of circulation.

ARTESIAN WELLS.

If the editor has any claim to the attention of those who are conversant with the subject, he will feel much indebted for any information that can be given on the *modus operandi* for boring *Artesian Wells!* We have repeatedly expressed our conviction of the importance of diffusing more widely the practice of *boring for water*—we want to know the cost of machinery for that purpose, as well as the probable cost per foot for 1, 2, and 300 feet—the difference in the cost, if any, in passing through clay, sand, rock (limestone or sandstone), at each of those distances, together with any other items; and will have any engravings made with pleasure that may be needed, from drawings furnished to illustrate the subject.

We should suppose it all to be well understood in Alabama, where the most fertile and productive districts would be barren wastes, but for the facility with which water is obtained by boring, as we have understood, through a substratum of sandstone.

We think we have a friend at West Point, so skilled in civil engineering, to which this would seem to appertain, that we indulge the hope of help and knowledge from that quarter, and feel that we may claim it as not an inappropriate return for having, as chairman of a committee on the domestic economy of that place, when a visitor there (as we have twice had the honour to be), suggested and demonstrated how they could obtain, as they now do, in consequence of that report, an abundance of delicious water for all purposes, from the mountain, in lieu of a precarious supply by wells and pumps.

THE COTTON MANUFACTURE INDUSTRY.

The Editor of the New York *Dry Goods Reporter*, whose opportunities for information are most extensive, and to whom we shall often be indebted for items interesting to our readers; remarking on a controversy which has lately appeared in *Hunt's Magazine*, says—

It would seem, therefore, that a new era has been reached in the cotton manufacture. The production of coarse goods in the United States being established beyond reach of contingency, is passing southward and westward; and that branch of finer productions, of which the Portsmouth Company is the great pioneer, must hereafter occupy the East. Skill and capital are the great elements of its production, and cost of raw material has far less influence upon its prosperity, being but a small item in the cost of the finished

article. If the view held by Mr. Lawrence and others is correct, viz. that the demand for cotton now gradually increases upon supply, and that therefore a higher range of prices must be looked for in the next ten years as compared with the last ten, that of itself is a powerful reason why the old established eastern factories should seek a counteracting element in the finer numbers. The fact that the South is going rapidly into the manufacture of cloths, is an additional reason why that result will be accelerated.

To the Editor of "The Plough, Loom, and Anvil."

Washington, 16th of Jan. 1850.

Sir—In the 2d vol. of your valuable work, No. 7, for the month of January, 1850, you have, I notice, been pleased to insert my humble attempt to respond to your inquiry of some one of your correspondents, as to the "best mode of dividing a farm, primarily devoted to the culture of wheat, corn, and clover; to the support of so much stock only as the operations of such a farm might require, having a view to economy of fences, and improvement of the land." And to this attempt of mine, you, Mr. Editor, under the control of your habitual courtesy, and characteristic kind feelings, have prefixed some remarks more highly commendatory of that attempt, and of its author, than he had the vanity to claim for it, or for its author; or he might have been induced to do, what you have been pleased to do for him, by subscribing his name to it. Having done this, you, by way of damper, subjoin to my proposed plan, the following commentary, viz. "We should apprehend it would be very tedious work to renovate worn-out farms, without more barn-yard manure than this system would give. The writer goes on the supposition that plaster of Paris will act on all land. But suppose that not to be the fact, as is the case on the Eastern Shore of Maryland, where there is but a small portion of land on which plaster will produce any visible effect. And then, again, on how large a portion of the country is lime too distant and dear to admit of being used? what would it cost in Fauquier and Rappahannock counties, Virginia?"

It is respectfully suggested, that the author of the foregoing commentaries might have found a satisfactory answer to his implied objections to my proposed plan, in the fact, that no general system of agriculture ever was, or can be, devised, which, when put in practice, will not be met by impracticable exceptions. The fact, then, that lime is not attainable in the two counties named, and that plaster of Paris will not act on the Eastern Shore, can furnish no objection to the use of both, in those extensive regions of our country, where both lime and plaster are readily obtained at a moderate cost, and when judiciously applied to worn-out land, act with the almost magic effect of restoring the dead to life.

When worn-out lands are too distant from lime, or so constituted as that plaster of Paris will not act on them, and the sole reliance for their restoration is on barn-yard manure and judicious culture, the operation must, of necessity, be comparatively slow in its progress and consummation. But that lands thus situated and constituted may be restored to a productive condition in three years, upon the plan I proposed in your January number, I have no doubt, and in the mean time yield a better annual profit, than if managed on any other plan now in practice. In regard to plaster of Paris, allow me to say, that I have found but two conditions of land unfriendly to the effects of it. One condition is, when land is naturally wet. The other is, when the land is full of aluminous acid, as shown by a bountiful growth of sheep-sorrel. In wet land, the moisture, which plaster would artificially supply on dry land, is already present. And where aluminous acid exists in land, the plaster is neutralized and becomes a caput mortuum, as soon as it comes into contact with that acid. May not this be the condition of the land on the Eastern Shore of Maryland, of which you say plaster will not act? If so, previous to the application of plaster on them, they should be liberally dressed with lime, chalk, or wood ashes, all very convenient to our brethren of the plough in that region. Then plaster will act.

In conclusion, I beg leave to repeat my conviction, that it comports best with the interest of him, whose capital is land, so to manage as to render every acre of it annually profitable, in some form or other. Such, in my humble judgment, is the plan of management which I presumed to recommend in your January number, and in order to free it from your objections, I venture to tax your patience and kindness with this communication. And am, dear sir, your constant and sincere friend,

JOHN TALIAFERRO, of Virginia.

J. S. Skinner, Esq.

READINGS FOR MOTHERS AND CHILDREN.

Again is our space for this nevertheless favourite department, encroached upon, as many a housewife's department has been before to-day for the accommodation of the coarser half of the world.

In the last number, we gave a letter from the late William Wirt to his daughter, and now we offer an extract from another, marked for this purpose as we went along. It would, in fact, be easy to levy contributions, for months to come, on the same rich resource. Of the "small sweet courtesies of life," here recommended, we had ourselves a taste lately at the capital of the Old Dominion.

It was a clear, balmy, spring-like Sunday afternoon, and being left without acquaintance in the hotel, we longed for the back of a good horse, to go riding off up the falls, and "over the hills and far away."

A servant was sent accordingly, who, after a long stay, returned, saying he could get "no hoss without de money." "Thinks I to myself," there's been horse thieves in these parts! So we gave Jehoshaphat the money to go and pay the hire; but now again he returned, quicker than before, saying that there was "no hoss to be got," for love nor money; but insinuated, in a sort of half whisper, that if master would try his luck in person, perhaps he might succeed. So away we climbed the hill to the stable. The ostler still said, it was *no go!* And so it would have been, but, luckily for us, there was standing near a Mr. Luck, a young gentleman, and an entire stranger, who, seeing our disappointment, kindly put in practice one of those "small sweet courtesies of life," which help to smooth its rugged places, by quietly ordering Sambo—"saddle my horse and offer him to the gentleman." And thus, instead of being left to mope away a long afternoon in the Exchange Hotel, we exchanged that annoyance for a delightful ride on the back of a good iron-gray; General Jackson's favourite colour—a trusty son of old Eclipse—meditating, and venerating as we rode, the great bounty of Providence, in the profusion of his gifts to that region and neighbourhood; and lamenting the infatuation under which the good people of the Old Dominion are inveigled into a disuse—which is but another word for the absue—of such magnificent resources.

There has Providence placed a noble navigable river, far up from the ocean into the very heart of the country, and at its head an inexhaustible water power, with which, and its neighbouring beds of coal, to manufacture and bring into condensed form for use and for commerce, the vast resources of plain and mountain. In place of which, what do we behold? This vast power of water splashing, and rolling, and wasting itself over beds of rock. And Virginia, instead of feeding, here on the spot, tens of thousands and hundreds of thousands of hardy and thriving manufacturers of her iron and her wool, her leather and timber, her brick and stone, with her own flour, and beef, and mutton; is lulled by the syren song of free-trade, and sending to Old England and New England, for everything that wood, and wool, and leather, and iron can make! But we had forgotten where we are—to write thus in the department of mother and children. Very well, say we—let the children read. Men who have grown old and stiff in political prejudice rarely revise their opinions; as Napoleon said of the Bourbons, they never forget, and they never learn. The party harness being once put on, it takes a set, and one lighter and more improved would serve but to chafe and gall them. The twig must be bent when it is young, and if common sense could have its sway the present generation would reach maturity in utter disbelief or amazement, that the nation had been so long in learning that every people who would learn to prosper, must learn to foster their own resources, and to work up their own materials.

I want to tell you a secret. The way to make yourself pleasing to others, is to show that you care for them. The whole world is like the miller of Mansfield, "who cared for nobody—no, not he—because nobody cared for him." And the whole world will serve you so if you give them the same cause. Let every one, therefore, see that you do care for them, by showing them, what Sterne so happily calls, "the small sweet courtesies of life"—those courtesies in which there is no parade; whose voice is too still to tease, and which manifest themselves by tender and affectionate looks, and little, kind acts of attention—giving others the preference in every little enjoyment at the table, in the field, walking, sitting, or standing. This is the spirit that gives to your time of life, and to your sex, its sweetest charm. It constitutes the sum total of all the witchcraft of woman. Let the world see that your first care is for yourself, and you will spread the solitude of the Upas tree around you, in the same way, by the emanation of a poison which kills all the kindly juices of affection in its neighbourhood. Such a girl may be admired for her understanding and accomplishments, but she will never be beloved. The seeds of love can never grow but under the warm and genial influence of kind feeling and affectionate manners. Vivacity goes a great way in young persons. It calls attention to her who displays it; and, if it then be found associated with a generous sensibility, its execution is irresistible. On the contrary, if it be found in alliance with a cold, haughty, selfish heart, it produces no further effect, except an adverse one. Attend to this, my daughter. It flows from a heart that feels for you all the anxiety a parent can feel, and not without the hope which constitutes the parent's highest happiness. May God protect and bless you.

Your affectionate father,

WM. WIRT.

TEXT AND COMMENTS.

"*Text:* 'Give a little water.' *Gardeners' Journal.—Text:* 'Water sparingly.' *Cottage Gardener.—Comment:* There is not, in all the foolish books on gardening, a more mischievous piece of advice than is contained in these silly injunctions; and if all the florists and nurserymen in the kingdom had combined to destroy the plants in private hands, they could not have hit upon more effectual means than enforcing such lessons. 'Giving a little water' destroyed as fine a sample of Heaths as was ever seen in a private grower's hands. The advice is pernicious. 'Water seldom' will apply to many things; but common sense should tell us, that the object of watering is to feed the roots, and if the water does not reach the extreme points, or spongioles, it is useless or mischievous. In the very depth of winter, when plants want less than at any other time of the year, the watering of plants should be as copious as in the hottest summer. Never 'give a little water'—never 'water sparingly.' Every atom of the soil in a pot should be wetted, and that is all it wants in summer; the only difference is, that in summer it may want watering twice a day, because the water is absorbed and evaporates rapidly, and in winter, perhaps, only once a month, because it is absorbed and evaporates so slowly. We once saw a quantity of Heaths looking very poorly, and observed to the owner, that there was something wrong; they had then just been watered; we observed, that they must have had too much or too little water. On turning out one of the balls, it was wet just half an inch down the pot, and below this it was as dry as snuff. 'Who waters these plants?' we asked. 'I do.' 'How often?' 'When they get towards dry.' 'One more week at this rate,' we observed, 'would have killed the whole collection.' The grower said, 'he never could grow Heaths; he had, first and last, had hundreds die. Yet he had attended strictly to the directions he had read, and that had been given by nurserymen.' He had been always told to 'give but little water' in winter, and none while they remain damp, and these had not been wetted lower than half an inch down for two months. We cannot, therefore, too strongly urge our amateur friends to act upon this assurance, that 'plants in pots always, winter and summer, want the same quantity of water at every watering; the entire soil should be wetted. The only difference is this, that, as they only require watering when the soil is getting dry, it may get dry twice a day in summer time, and be three weeks or a month getting dry in winter.' Men of very small intellect read old books, and write over again, very imperfectly, and in other words, what they have read; these are the description of men who are always 'rushing into print.' They are ambitious to see their names published; and they have done more real mischief to horticulture than any other of the thousand ills that cross a science in its advance."